Pests

AND THEIR CONTROL

1946

JULY

VOL. 14, NO. 7

ORGAN OF THE PEST CONTROL INDUSTRY

Exterminators
Fumigators
Termite Control Operators
Entomologists
Insecticide and Supply Mfgrs.

7

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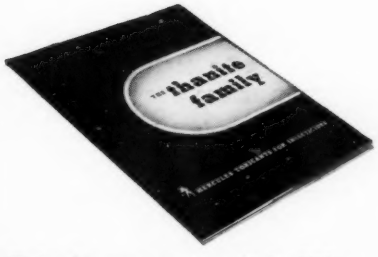

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PROCEDURE: Seal off-side door. Bore 3/8" hole in floor next to near-side door (thru which door you are working). Run Saran tubing through hole and fasten at ceiling above car contents. (Methyl Bromide is heavier than air—it penetrates down through the car). Seal near-side door from the outside. Post warning signs, after arranging that car will not be moved for 12-18 hours. Release gas. Remove tubing and plug hole with short length of dowel peg.

SEALING TECHNIQUE: Sealing the doors can be done with 4" wide Kraft paper (4" masking tape can be used, if desired, on dry, dust-free surfaces). To stick down paper, use either light cup-grease or a good grade of casein paste. Smear cup grease all around door and press greased paper into band of grease. If you use casein paste, apply it around doors, press paper on to it and then smear another coat of paste over the paper and adjoining woodwork. Be certain to seal leaks around the rollers of the door tracks. Note: if there is a bad gap between car and either door make up a putty of 8 parts powdered asbestos, 3 parts flake calcium chloride and 4 parts water by weight to fill chinks and openings around door. Then paper over as previously noted.

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WARNINGS: (1) Check cars for leaks in walls, ends, and roof, and seal before fumigating. Do *not* stuff paper or rags into such leaks or around doors. This does not seal car properly.

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and Their CONTROL

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COOPERATING WITH NATIONAL PEST CONTROL ASSOCIATION

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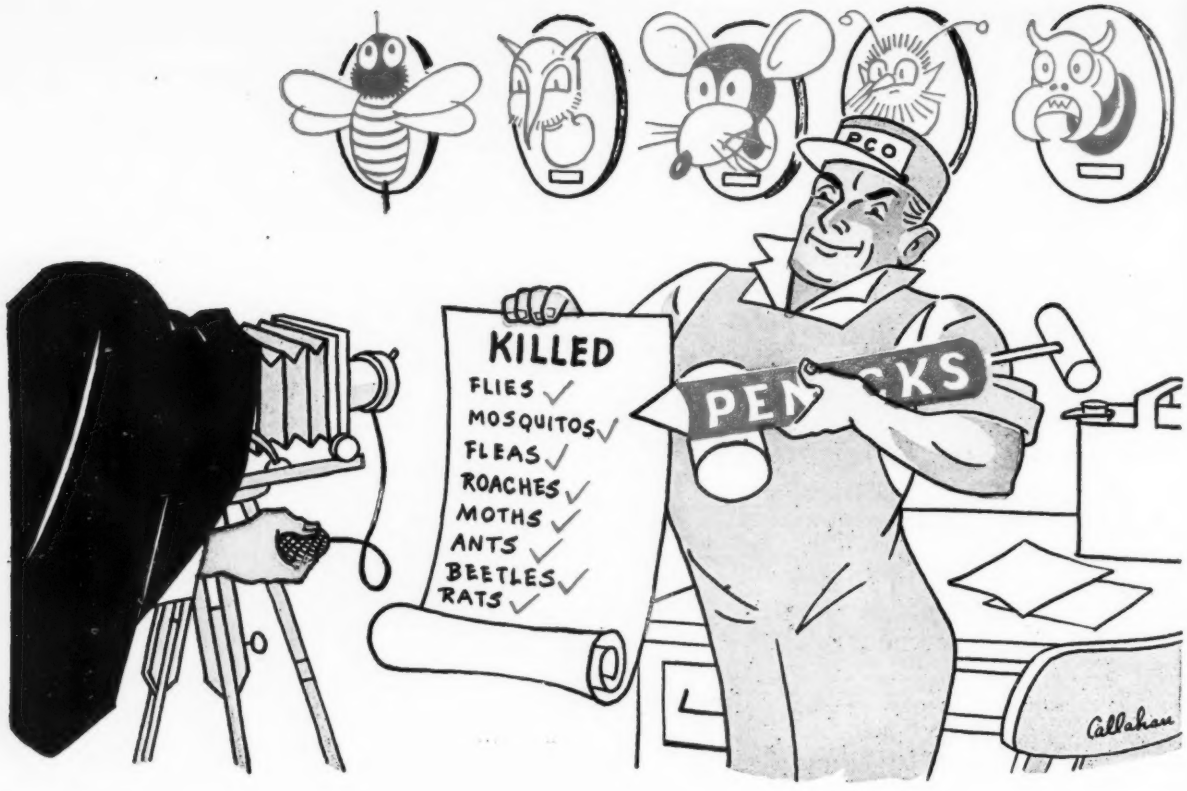

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EDITORIAL

Inspection, Enforcement, Education Only Effective Answers

A SIGNIFICANT development in Industry affairs has been the emergence of the city-employed rat crew—a development which is bringing the city into competition with commercial enterprise, and we don't mean with just the PCO, either.

It is the belief of many that political considerations such as the maintenance and creation of jobs, appropriations, and pressure groups are basically involved in the agitation for, and the genesis of, the city rat crew.

It has been the consensus of those in the vanguard of the Industry's welfare that any health officer given assistance by way of trained inspectors, a sensible ordinance including surveys and inspection, enforcement and education, there is no need for the city government to go into the business of rodent control.

That there are forward-looking city officials who are thinking along these lines is highlighted by a recent article in The Brooklyn (N.Y.) Eagle (June 8), in which Mayor O'Dwyer "was reported to be favorably inclined toward a Health Department request for 150 additional inspectors based on a report by Dr. Israel Weinstein, health commissioner, on unsanitary conditions in some of the city's 100,000 retail food establishments."

Continuing, the article quoted Dr. Weinstein to the effect that correction of the situation was imperative "in view of the fact that he had found food prepared in cellars encrusted with filth; food contamination by cockroaches, and rats; improper refrigeration; dishes washed in lukewarm and dirty water; no facilities for food handlers and patrons to wash their hands." These conditions, Dr. Weinstein noted, however, "were found mostly in low grade types of restaurants and represented a small minority of city food establishments."

"In asking for a $300,000 appropriation," Dr. Weinstein complained that "he had only 56 inspectors for retail food inspection. There are 20,000 restaurants in the city."

Dr. Weinstein's report "requested that an assistant corporation counsel be delegated to aid him in prosecuting violators of the sanitary code," adding the city Law Department was drafting an amendment to the code to strengthen the Health Department in dealing with violators."

In short, as NPCA Service Letter No. 400 so ably points out, "the solution of any rat problem depends upon various interests which may include Federal, State and/or Local governmental agencies together with Civic and Commercial (PCO's, contractors, manufacturers of rodenticides) interests sitting around a common table and arriving at a program that recognizes the part each can and should have to bring about satisfactory results."

'The Valley Forge Caravan' . . . Salutes The Pest Control Industry!

SUBJOINED is the text of a special radio tribute to the Pest Control Industry made over Station KYW, Philadelphia, on May 18, and is welcome evidence, if any is needed, of the growing respect and recognition being accorded the Industry. Sponsored by the Adam Scheidt Brewing Co., of Norristown, Pa., "The Valley Forge Caravan" is a one-hour radio show that delivers a salute each night to one of America's industries.

The radio script follows:

And such is the modern title of business formerly known as "fumigation and extermination." We salute as our hosts tonight, two members of the vital National Pest Control Association, Inc. They are the Messrs. W. C. Wheeler and Walter Cholerton of the A.B.C. Exterminating Company and Mr. John G. Vogel, President of Vogel-Ritt, Inc. It is the purpose of those engaged in this industry to understand the habits and nature of, and so control the insect and animal life within the pest category and thus to stem the inroads they would make on our civilization if not curbed in their vicious attack. Fumigants, used in this business are such agents as will effectively combat pests, and are gases considered toxic to insects and warm-blooded animals.

It is well-known that congested areas are likely to be nesting and breeding grounds of pests of all types, and there the work is most concentrated, but it must be realized that pests can strike anywhere that conditions are conducive to their growth. During war-time "structural pest-control" was a war-born necessity and thus was designated an essential activity. The principal function then was to protect war plants, food industries, ships, hospitals, warehouses and the general public from the infestation of insects and rodents who destroy and contaminate food and critical commodities and who are carriers of disease . . . a serious menace to public health. The industry served nobly in this capacity. During this period of urgency, great advances in the study and development of insecticides were made. As common problems crystalized and new horizons appeared, most progressive members of this industry joined into a strong permanent organization to pave the way for future expanded activities. Educational machinery within the National Pest Control Association called upon eminent entomologists, biologists, chemists and health officers to scientifically and efficiently attack the problems of this industry. Today, members are notably "on their toes" in know-how to combat almost any problem and this augurs well for the future of this nation which heretofore has lost millions annually to the attacking pests. Our hats are off to the men and women of this Industry tonight which will safeguard our health and facilities!

Theatre Pest Control and the PCO

A NOTEWORTHY contribution to literature on pest control in the theatre appears in another section. Titled "Management Can Beat Its Insect Problems," its author, Dr. H. Shepard, describes insect species infesting theatre structures and methods for their control, stresses importance of protective pest control and the role of the PCO therein and also in combating infestation.

Because of his training, experience and knowledge, the PCO is far better equipped than theatre personnel (oft-times pressed into service) to maintain such-type structures in a sanitary, pest-free condition. While more progressive theatre managers have, in the main, acted on that assumption, there is room for further improvement along these lines. For that reason, among others, both management and the PCO will find Doctor Shepard's paper one of undoubted value.

Notice

We are glad to print personal items of interest. Send us interesting or newsy items about yourself or your family. This magazine is for the Pest Control Industry, and news about YOU is interesting

Post-War Insect Control Problems from the Viewpoint of Pest Control Operators*

**Summary of remarks made by J. J. Davis, Purdue University, at the annual meeting of the N. C. State Entomologists Association, at St. Louis, Mo., March 28, 1946.*

AS I talk with commercial pest control operators, there is a varying degree of concern regarding the future of the industry, which is reflected in the developments which have taken place in recent years, both as to insecticides and applicators. However, it seems to me that those who have studied and analyzed the situation are convinced that the future is very bright for those who keep up-to-date on developments, those who find use for these new materials and equipment in their operations, and who use them with skill.

Some are apprehensive of the future because they feel that the new insecticides which have been so thoroughly publicized will enable the public to do their own service, forgetting perhaps that correct application is far more important than the chemical used, no matter how effective it may be. While the aerosol applicator is a valuable contribution to the control of certain household insects, it is by no means the solution to the clothes moth problem, as so many advertisements would lead the public to believe. These new insecticides and the publicity they have received, instead of reducing the demand for service will probably increase the demand, for the public will have become insect-minded, and after unsatisfactory results from the cure-alls, will demand service more than ever. The commercial operator, who will package and sell the new products perhaps has less concern, at least in the immediate future, for he undoubtedly will have a good sale for these new products.

Some pest control operators believe the public will demand a higher standard of service and that a better service can be rendered because of the new insecticides now available and those which will be available in years to come, and because of the newer and better applicators.

From my contacts I would say that the pest control operators who are looking to the future recognize the necessity for both technical and practical training, and ability to sell products intelligently as well as give good service.

Urban congestion and housing shortage has aggravated pest problems and as a result there is already a demand for better sanitation, and this will call for increased pest control service.

Perhaps the present poor construction of buildings and poor grades of materials, especially lumber, that are available will have an important bearing on insect and rodent problems.

The Food and Drug Administration has already increased its activities as to insect and rodent contamination in food processing plants and this is certain to call for a greater need for the advice and service of the pest control operator.

It is our opinion that there is an increasing field for consultants, and branching out into other fields of pest control, such as spraying of shade trees and shrubs and large scale fly and mosquito control programs.

As already intimated, the public in general will not achieve the results anticipated from the use of new insecticides and will become discouraged in their use. Furthermore, some materials, such as 1080 are too hazardous in the hands of the average citizen. Therefore, it will become the duty of present and future pest control operators to become thoroughly familiar with the new insecticides and rodenticides, new and proper techniques in their applications and the potential hazards, just as the medical men have adopted and made use of the several new medical discoveries.

New insecticide developments will probably not affect fumigations by large industrial operators, but it seems likely that there will be a decrease in demands for household fumigations as a result of the effectiveness of DDT for bedbugs, which from the most part have not been major operations of the pest control operator.

Perhaps the public in general recognizes the hazards of new imported insects as an aftermath of the war, which may well affect health, crops, animal production, all of which may have a direct or indirect effect on the pest control operator of the future.

Education. In my opinion there is no question regarding the need and future of the well-informed commercial pest control operator. Further, it is my opinion that the greatest need for our future pest control operators is education.

Ten years ago we inaugurated a P.C.O. Conference at Purdue. At the present time we have five regional conferences, four in the United States and one in Canada. These have had a remarkable effect on the ethics of the industry and the value of services rendered. To illustrate the interest shown, I would like to report that at our 10th Conference at Purdue last January, there were 262 registrations from 27 states and Canada.

At the request of a number of pest control operators we have developed a 4-year curriculum at Purdue for pest control operators. Our first objective is to give enough fundamental work to turn out well-educated men and women, with adequate training in the junior and senior years in business and in the practice of pest control. To meet a further demand which I believe will result in a marked degree of value to the pest control industry, we are putting on, this year for the first time, a short course for Sanitary Inspectors.

More and more the pest control operator is being called into customers' premises to identify, and control or exterminate pests which develop. This calls for better trained men who can identify the pest problems and properly diagnose the situation in order that they may properly direct the operations of their service men. Even the service men employed in the future must be far above the level of intelligence of those now employed or who have been employed in the past, and this will call for higher salaries for such service men.

Legislation. More and more the pest control operator is being faced with the possibility of state legislation which may be very exacting. We should do more toward having available model laws, and entomologists and pest control operators alike should be on their toes to prevent the enactment of state legislation which will be intricate and unsatisfactory. In some states the regulations lie in rulings made by separate bodies, such as the State Board of Pharmacy and the State Board of Health. While it may be desirable to include representatives from such organizations, pest control should be in the hands of one competent group, rather than in several groups. Furthermore, any

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state legislation should carry with it adequate funds to operate the law, and should not be dependent on fees required. After all, such legislation is intended to protect the citizens of the state and therefore they should bear the cost of its operation. If funds are not made available for the proper inspection and enforcement service, the law will probably fall short of its goal.

Publicity and Advertising. The future of pest control, in addition to better and more ethical service, also calls for more ethical advertising and sales. Much has already been done in the improvement of advertising, especially in telephone directories, but there is still a need for betterment in such advertising.

Perhaps there is as much misrepresentation in retail sales of insecticides as in service, especially in the case of some of the new materials. For example, I have the following from a Chicago pest control operator: "I have in my hand at the moment an 'Aerosol Bomb,' which I purchased at Marshall Field and Company. The clerk that sold this bomb to me assured me that with the use of this bomb I would rid my house of flies and mosquitoes; by using it in the clothes closet I would positively kill all cockroaches present, and she further went on to cite a case of one purchaser, who had, in two applications, eliminated a bedbug condition that Pest Control Operators had fumigated for on different occasions, without success. I was told further that with the DDT that was in the bomb (.48 of an ounce) a deposit of DDT would be left, which would prevent the above insects returning.

"Incidentally, another selling point on the bomb was the fact that it was refillable—although I was not able to develop why that was an advantage when apparently one or two shots were supposed to fix my house up for keeps."

I don't mean to take picks on aerosol bombs particularly—I am just using this instance as a case in point. The aerosol bomb, I do believe, has a very distinct field and is highly efficient in that field, but we certainly know that it is not the answer to insects or insect eggs that are deep in cracks and crevices. By the same token we also know that application of fluoride or DDT back of sinks and along baseboards is not going to eliminate many flying insects. But Mr. John Q. Public doesn't know these things and it seems to me that along the lines of factual publicity John Q. could be materially helped by the entomologists.

Some Ecological Factors Influencing the Control of Carpet Beetles and Clothes Moths[1/]

By E. GORTON LINSLEY, *University of California, Berkeley*

Paper presented before a meeting of the Pest Control Operators' of California, February 26, 1946.

CARPET beetles and clothes moths are among the oldest and most ubiquitous of man's household pests. As a result of this fact, the entomologist has devoted a considerable amount of study to their biology and control. In present practice, control measures center mainly about three approaches to the problem, (1) destruction of the insects within the household (primarily by fumigation), (2) exclusion of the insects from those portions of the house in which they would be likely to do the most damage (largely by means of repellents), or (3) protection of the products which they might injure (mainly by mothproofing). These methods and others in current use cannot be applied intelligently or economically and may even fail completely if adequate consideration is not given to the habits of the species involved.

Many valuable studies have been made on the biology of carpet beetles and clothes moths (Back & Cotton, 1936, 1938; Griswold & Greenwald, 1941; Herfs, 1936). These studies have been made in the laboratory and have provided us with information on the development of the various species under different physical conditions as well as other detailed data of interest. However, almost no attempts have been made to correlate laboratory observations with behavior in the field and, until very recently, scant interest has been shown in the occurrence of carpet beetles and clothes moths in nature or to natural foci for household and warehouse infestations. With few exceptions most of the information on this subject which has crept into the literature has been gathered in the course of taxonomic or general biologic, rather than economic, investigations. This has probably been due to the influence of the early workers who apparently accepted the view point that most of our carpet beetles and clothes moths were of Old World origin and existed in North America mainly as household insects, a habitat for which they were very well adapted. As a matter of fact, more than half of our pest species are probably endemic to the New World and the geographical origin of many of the remainder is in doubt. Furthermore, it would appear that both carpet bettles and clothes moths are far more abundant in nature than they are in man-made structures and evidence available at this time suggests that the household is actually a relatively unfavorable environment, at least for carpet beetles, and foci for infestations are frequently outside of the structure, a fact which must be kept clearly in mind if a control program is to succeed.

In the last few years a number of cases of extremely persistent infestations of carpet beetles or cloths moths have been called to our attention by home owners or pest control operators. In most of these cases repeated fumigation with unusually heavy dosages of hydrocyanic acid gas had provided little more than temporary relief. Further investigation revealed that these infestations were arising from bird nests under eaves or in tile roofs, honeybee nests in walls or chimneys, deserted hornet nests (Dolichovespula arenaria Fab.), and, in one case, nests of the yellow and black mud dauber (Sceliphron servillei Sauss.) in an attic. In order to determine to what extent such factors might influence household and warehouse infestations a survey of central California and the San Francisco Bay region was undertaken. This survey clearly indicated that nests of birds, rodents, insects and spiders were all factors which need to be reckoned with in the control of clothes moths and carpet beetles.

Habits of Carpet Beetles and Clothes Moths in Nature

All of the carpet beetles and clothes moths which have been studied by the writer hibernate as full grown or nearly grown larvae or more rarely as transformed but quiescent adults (Anthrenus lepidus Lec.). During this period they require a protected and more or less dry environment in the presence of an abundance of food material (animal products such as fur, feathers, dead insects, or certain plant products such as seeds, pollen) for the resumption of feeding in the spring. In nature these conditions are best met in nests of birds, rodents, insects or spiders located in hollow trees,

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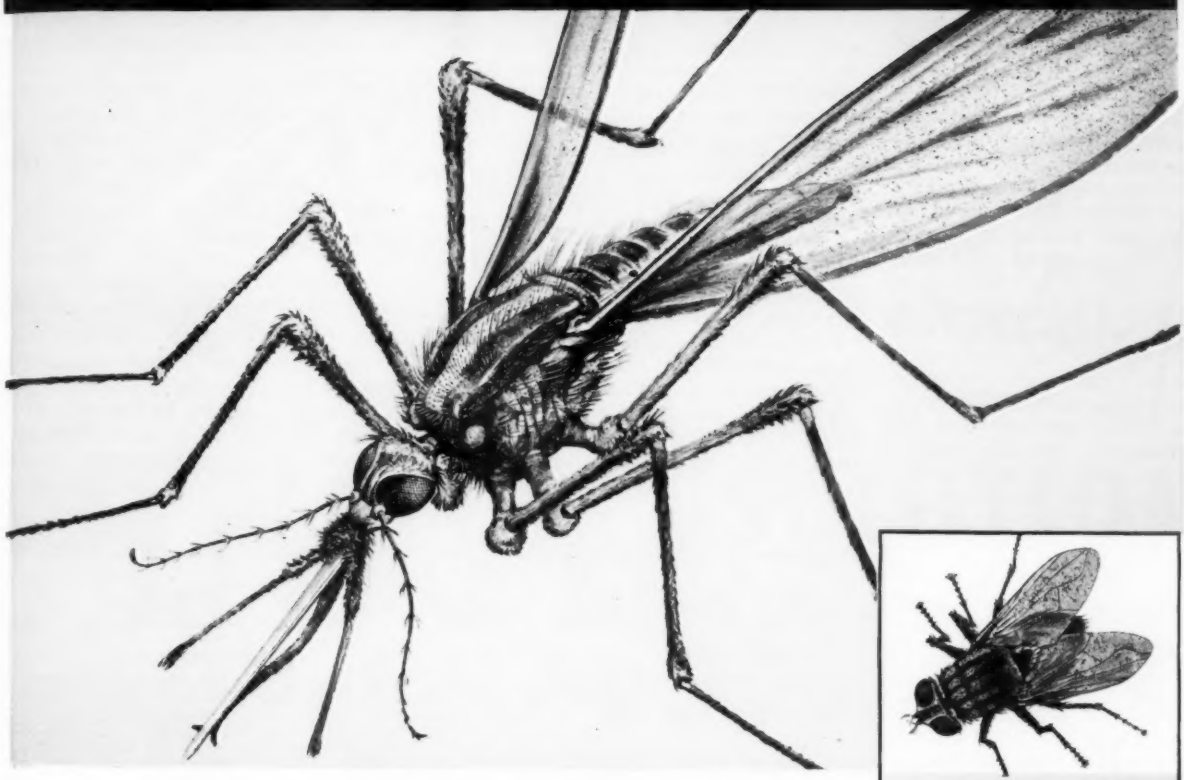

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under logs, in cliffs, banks, caves, etc. Exposed nests, especially of birds, rarely remain dry enough to permit survival of large populations during the winter months. In the spring, the larvae resume feeding, complete their development and, in the case of carpet beetles fly to flowers for nourishment and mating. Later, they seek out a breeding habitat for oviposition. Thus, for these beetles, the ideal habitat must not only be protected from moisture but also must be accessible to the flying beetle returning from flowers. Adult carpet beetles which have not fed on pollen and nectar lay fewer viable eggs, and in the case of some species lay no eggs at all. (This is, of course, not true of the clothes moths and once they have reached an inaccessible habitat they can continue to breed there as long as conditions remain otherwise favorable.) Obviously, the various conditions are met far more satisfactorily on the outside (especially the underside) of various man-made structures than they are within them. When we add to this that both clothes moths and carpet beetles prefer natural animal and plant products (feathers, fur, raw wool, dead insects, seeds, pollen) to processed products (woolen cloth, fabrics, flour, etc.), it is not surprising that these insects are far more abundant in nature than in houses. This is not meant to imply that they are not a serious household and warehouse problem, because they most certainly are. However, in order to understand such infestations it is necessary to view them in relation to the ecology of the insects as a whole.

The varied carpet beetle, **Anthrenus verbasci (Linn.).** In the field, as in the laboratory, this species has but a single generation a year. The winter is passed in the larval stage and when temperatures are favorable feeding continues during this period. In early spring (about the middle of March in central California) the larvae pupate and transform to adults. In the field the pupal period usually requires between two and three weeks although as little as nine days may be involved under laboratory conditions. After transformation the adults remain in the larval skin for a day or two and then emerge, seeking flowers for mating and feeding. After mating the females search out the nests of bees, wasps, spiders and other favorable habitats for oviposition. The favored larval food is dead insects and spiders, a fact which accounts for their ravages in insect collection. The nests of **Sceliphron,** which stocks its cells with spiders, and spider webs, with their accumulated insect carcasses, are common natural habitats, as are various other places where dead insects are available. Fur and feathers undobutedly serve as elements in their natural diet as does the pollen stored by bees. (This latter product provides a satisfactory laboratory diet, bringing the beetles to maturity in a little more than 300 days. Milled cereals such as whole wheat flour may require over 400 days for development.)

The birdnest carpet beetle, **Anthrenus lepidus, Lec.** This species is represented in the United States by several races or varieties. These may differ from each other slightly in habits but their general biology is similar and in contrast to that of **A. verbasci.** The black larvae are similar to those of the Buffalo carpet beetle, **A. scrophrulariae** (Linn.) and the furniture carpet beetle, **A. vorax** Waterhouse. In California the adults emerge in March and April and fly to flowers, especially Umbelliferae and Compositae for mating and feeding. They then seek out birds nests for oviposition. The larvae feed primarily on feathers and animal hairs. In the laboratory we were unable to rear them successfully on diets of pollen or whole wheat flour although dead insects proved fairly satisfactory. On feathers or fur no difficulty was encountered, although we were unable to induce oviposition or to obtain viable eggs from females which had not first fed on pollen and nectar. The larvae grow more rapidly than do those of **A. verbasci.** They pupate in late fall and the adults overwinter in the last larval skin. They emerge a little earlier than **verbasci** and in warm spells can be found on flowers early in March.

The rodent nest carpet beetle, **Attagenus schafferi Herbst.** In the field this species appears to live primarily in rodent nests. It is somewhat of a montane species and is more abund-

TABLE I

Occurrence of Carpet Beetles and Clothes Moths in Nests of Some Birds Which Nest About Buildings.

Bird	Nests	Insect	Specimens	Localities in California	Date
English Sparrow (Passer domesticus)	6	Anthrenus lepidus	169	Bakersfield	2-17-44
	1		43	Tulare	2-16-44
	3		104	Walnut Creek	2-22-44
	1		19	Lafayette	3- 2-44
	2		21	Berkeley	3-10-44
	1	Anthrenus obtectus	34	Woody	2-18-44
	1	Attagenus nigripes	3	Bakersfield	2-17-44
	1		14	Woody	2-18-44
	1		11	Walnut Creek	2-22-44
	1	Trogoderma versicolor	28	Woody	2-18-44
	4	Tineola bisselliella	141	Bakersfield	2-17-44
	1		73	Tulare	2-16-44
	1		22	Lafayette	3- 2-44
	1	Tinaea pellionella	73	Woody	2-18-44
	1		183	Berenda	2-15-44
House Finch (Carpodacus mexicanus frontalis)	1	Anthrenus lepidus	6	Bakersfield	2-17-44
	1		14	Walnut Creek	2-22-44
	2		31	Lafayette	3- 2-44
	1	Attagenus nigripes	11	Woody	2-18-44
	1		2	Berenda	2-15-44
	1		9	Walnut Creek	2-22-44
	1	Endrosis sarcitrella	4	Woody	2-18-44
	1		19	Walnut Creek	2-22-44
	1	Hofmannophila pseudospretella	4	Lafayette	3- 2-44
Black Phoebe (Sayornis nigricans)	1	Anthrenus lepidus	3	Patterson Pass	3- 3-44
	1		28	Salinas	3-19-44
	1	Tinaea pellionella	73	Patterson Pass	3- 3-44
	1	Attagenus nigripes	9	Patterson Pass	3- 3-44
Barn Swallow (Hirundo erythrogaster)	1	Athrenus verbasci	3	Tulare	2-16-44
	1	Anthrenus lepidus	2	Berenda	2-15-44
	1	Tinaea pellionella	266	Tulare	2-16-44
Cliff Swallow (Petrocheildon albifrons)	10	Trogoderma sternale	272	Madera	2-15-44
	10	Attagenus nigripes	31	Madera	2-15-44
	1		3	Bakersfield	2-17-44
	1	Tinaea pellionella	9	Madera	2-15-44

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TABLE II

Occurrence of Carpet Beetles and Clothes Moths in Nests of Some Wasps and Bees Which Nest About Buildings.

Wasp or Bee	Nests	Insect	Specimens	Localities in California	Date
Polistes aurifer	1	Anthrenus verbasci	8	Bakersfield	2-17-44
Dolichovespula arenaria	1	Trogoderma sternale	11	Bakersfield	2-17-44
	2	Anthrenus verbasci	28	Bakersfield	2-17-44
Sceliphron servillei	2	Anthrenus verbasci	6	Chowchilla	2-15-44
	1		2	Berenda	2-15-44
	14		27	Tulare	2-16-44
	9		39	Tipton	2-16-44
	3		16	Kingsburg	2-19-44
	4		11	Fowler	2-19-44
	17		43	Merced	2-19-44
	1		3	Tracy	2-19-44
	4	Trogoderma sternale	11	Chowchilla	2-15-44
	2		8	Berenda	2-15-44
	11		16	Tulare	2-16-44
	9		23	Tipton	2-16-44
	4		12	Oildale	2-19-44
	6		21	Kingsburg	2-19-44
	1		3	Fowler	2-19-44
	12		33	Merced	2-19-44
	6		14	Tracy	2-19-44
	1	Trogoderma versicolor	4	Bakersfield	2-17-44
	2	Perimegatoma veriegatum	9	Tracy	2-18-44
	3	Perimegatoma jaynei	11	Walnut Creek	2-22-44
	1	Trichophaga tapetzella	3	Tulare	2-16-44
	2	Endrosis sarcitrella	3	Tulare	2-16-44
	1		2	Tipton	2-16-44
	1		1	Kingsburg	2-19-44
Osmia lignaria	9	Anthrenus verbasci	26	Bakersfield	2-17-44
	4	Trogoderma sternale	5	Bakersfield	2-17-44
	26	Trogoderma ajax	51	Bakersfield	2-17-44
	5		23	Woody	2-18-44

ant at elevations of 4,000 to 6,000 feet. The adults are active in the summer time and lay their eggs in nests of chipmunks, woodrats, etc., as well as in those of birds. The winter is passed in the larval stage and pupation usually does not take place until May. The larvae prefer to feed on hair and fur but can be reared on pollen and whole wheat flour. They do not feed on the surface but bury themselves in food materials as has been previously noted for **Attagenus piceus** (Griswold, 1941). As a household pest it is largely confined to mountain cabins (Linsley, 1942).

The small black carpet beetle, **Attagenus nigripes** Casey. The habits of this species are similar to those of **A. schafferi** but it appears to be primarily a birdnest species and occurs more commonly at lower elevations. It has been found several times as a household pest.

The black carpet beetle **Attagenus piceus** (Oliv.). This species appears to be less common in the field than the two previous species, at least in California. Its habits, however, are similar. It breeds in both bird and rodent nests. The winter is passed in the larval stage and the adults are most abundant in the summer months. As with other species of carpet beetles the adults are flower visitors.

The webbing clothes moth, **Tineola bisselliella** (Hum.). This species apparently has at least two generations a year in the field. The second generation overwinters in the larval stage and transformation to the adult instar takes place in early spring (March and April). They breed in bird and rodent nests as well as in nests of bees and wasps. The larvae thrive on fur or feathers but appear to develop equally well on dead insects or on pollen. Frequently several hundred larvae may be found in a single nest of the English sparrow.

The case-making clothes moth, **Tineea pellionella** (Linn.). This species occurs commonly in bird nests as does its relative, **Tinaea fuscipunctella** Haw. It is not certain whether or not it has more than one generation a year in the field although there is evidence to suggest that there may be at least two generations. In any event, the species overwinters in the larval stage and emerges in the spring at about the same time as the webbing clothes moth. As with the latter species, several hundred individuals may occur in a single nest.

The white-shouldered house moth, **Endrosis sarcitrella** (Linn.). This species occurs rather commonly in bird nests and also in spider webs. It apparently has at least two generations a year and overwinters in the larval stage. However, adults appear very early in the spring and have been found in nests in the middle of March.

Sources of Infestation

Birds nests. Yokoyama (1929), Herfs (1936) and Hinton (1934b) have called attention to the role of bird nests in relation to Old World household infestations of carpet beetles. The species involved are **Attagenus piceus** (Oliv.); **A. pellio** (Linn.), **Anthrenus fuscus** (Oliv.), **A. verbasci** (Linn.), **A. scrophulariae** (Linn.) and **A. pimpinellae** (Fab.). Apparently no similar studies have been made in America, although McAtee (1929) has noted the occurrence of **Attagenus piceus** Oliv. in nests of the English sparrow, starling, purple martin, house wren, and bluebird, **Trogoderma versicolor** Creutz. **(inclusum Lec.)** and **T. ornatum** (Say) in nests of the English sparrow and house wren, and Jellison and Philip (1933) have reported **Anthrenus occidens** Casey from magpie nests. In California, the commonest carpet beetle in the nests of birds which nest about houses and buildings (especially the English sparrow) is **Anthrenus lepidus** Lec. As a household pest this species behaves much like **Anthrenus scrophulariae** (Linn.) but it is regarded as of minor importance at the present time. Only twelve household infestations of **lepidus** have come to the attention of the writer in the last three years, although these may have all been traceable to birds' nests. Probably of more importance, however, are the various black carpet beetles which occur in birds' nests (**Attagenus schafferi** Herbst, **A. nigripes** Casey, etc.). In the last few years most of the household infestations which have been encountered by the writer have involved either **Attagenus nigripes** Casey or some other native species, less than half have been attributed to **A. piceus** Oliv., although in warehouses and granaries the latter species is predominent. In addition, the webbing clothes moth, **Tineola bisseliella** (Hum.), the white tip clothes moth, **Trichophaga tapetzella** (Linn.), the white-shouldered house moth, **Endrosis sarcitrella** (Linn.), and the brown house moth, **Hofmannophila pseudospretella**

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(Staint.), and the case-making clothes moth, **Tenaea pellionella** (Linn.) all breed in birds' nests in California and thus have access to the house. McAtee (1929) has also recorded **Tinaea fuscipunctella** Haw. from nests of the English sparrow, starling, purple martin, house wren, bluebird, and crested flycatcher.

Rodent nests. The extent to which rodent nests may influence household infestations of carpet beetles and clothes moths is not known. The writer has recorded (Linsley, 1924b) infestations of **Attagenus shafferi** Herbst and **A. piceus** Oliv. (recorded as **piceus** Oliv.) in mountain cabins arising from chipmunk nests. The former species has also been found breeding in nests of the woodrat (**Neotoma fuscipes**) as well as domestic rats. **Trogoderma** spp. and **Anthrenus** spp. have also been occasionally found in rats' nests as have various clothes moths. Hubbard (1895) has reported the occurrence of the webbing clothes moth in nests of the kangaroo rat. However, except where rodents were unusually abundant or were using the same nest sites for long periods of time, it is probable that they play a far less important role than birds' nests as a source of household infestation.

Insects nests. The writer has previously (1942a) called attention to the fact that various household and stored products insects inhabit the nests of bees and wasps. Hinton (1934b) has stated that "in practice the nests of Aculeate Hymenoptera are rarely of even slight importance as reservoirs of injurious Dermestidae, and in this respect cannot be compared with either bird (chiefly sparrow) or spider nests which, because of their greater abundance and proximity to houses and warehouses where stored products are kept, are a factor to be reckoned with in the control of these beetles." It is possible that Hinton's statement may be true for England but it certainly does not apply to California. In this state, by far the most injurious dermestid to fabrics is **Anthrenus verbasci,** to foodstuffs, **Trogoderma sternale.** In a recent survey (Table I) the former species was encountered in birds nests only once, and in this case the nest was surrounded by those of **Sceliphron servillei** Sauss. On the other hand, both **Anthrenus verbasci** and **Trogoderma sternale** are common in the nests **Sceliphron, Polistes, Odynerus, Osmia** which regularly nest about buildings as well as in old nests of **Dolichovespula** and **Apis.** In many parts of California where carpet beetles are a serious problem, nests of **Sceliphron** and **Polistes** are far more numerous about buildings than are bird nests.

Spider webs. Hinton (1943a, 1943b) has called attention to the importance of spider webs as a reservoir for clothes moths and carpet beetles in two very interesting and informative papers. He has recorded both the white-shouldered house moth, **Endrosis sarcitrella** (Linn.) and the brown house moth, **Homannophila pseudospretella** (Staint.) from this habitat, as well as the dermestids **Attagenus pellio** (Linn.), **Ctesias serra** Steph., **Megatoma undata (Linn.), Globicornis marginata** Payk., **Trogoderma ornata** Say., **Anthrenus museorum** (Linn.), **A. fuscus** (Oliv.) and **Trinodes hirtus** (Fab.). In California, by far the most common dermestid in spider webs appears to be the varied carpet beetle, **Anthrenus verbasci** (Linn.), although we have found it consistently only in inhabited webs of the black widow spider, **Latrodectes mactans.** The larvae appear to feed on insect remains and damaged egg sacs. **Trogoderma sternale** Jayne, which also occurs in these webs, appears to actually enter undamaged egg sacs and to feed on the eggs as well as on insect remains and other debris in the web.

TABLE III

Occurrence of Carpet Beetles and Clothes Moths in Nests of Spiders Which Nest About Buildings.

Spider	Nests	Insect	Specimens	Localities in California	Date
Black Widow (**Latrodectes mactans**)	2	**Anthrenus verbasci**	119	Merced	2-18-44
	9		281	Tulare	2-16-44
	2		16	Tipton	2-16-44
	1		78	Fowler	2-19-44
	4		21	Kingsburg	2-19-44
	1		13	Chowchilla	2-15-44
	1	**Trogoderma sternale**	5	Chowchilla	2-15-44
	2	**Hofmannophila pseudospretella**	9	Merced	2-19-44
	1		7	Chowchilla	2-15-44
	1	**Endrosis sarcitrella**	14	Tulare	2-16-44
	1		2	Fowler	2-19-44
	1		5	Kingsburg	2-19-44

Conclusion

Nests of birds, rodents, insects and spiders harbor large numbers of carpet beetles and clothes moths.

Nests about houses and other buildings are more apt to be heavily infested than those in the open. The protected environment provides drier conditions and favors survival of the insects.

Such nests provide foci for household and warehouse infestation and may invalidate control efforts applied within the structure.

Control programs should include destruction of nests at the close of the breeding season, before the onset of cool weather which may drive the insects indoors.

A number of the carpet beetles require pollen for successful production of eggs and care should be taken not to bring these insects into the house on cut flowers. Such individuals, having mated and fed are more likely to provide the source of a serious infestation that individuals which have reached maturity within the confines of the building.

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ZINC PHOSPHIDE 10%....55c Lb., 10 Lb. Lots—Mix 2 Ozs. of paste with 14 ozs. food.
ARSENIC TRIOXIDE 50%, 40c Lb., 10 Lb. Lots—Mix 1½ Ozs. of paste with 14 ozs. food.

Attention Product Companies—Baits Packed For Resale

2% DISCOUNT CHECK WITH ORDER F.O.B. NEW YORK CITY ONLY

R. S. B. COMPOUNDING CO.

172 E. 91st St., New York 28, N. Y.

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PCO's Assist in Roanoke, Va. Rat Campaign

To Pests Magazine:

To implement a recently enacted city rodent-control ordinance, Dr. A. G. Evans, Roanoke Health Commissioner, invited the following members of the Industry, among others, to attend a meeting to discuss plans for a clean-up of the rats and mice infesting city dumps: Theodore Oser, president, N.P.C.A.; Henry Glasgow, Roanoke Exterminating Co.; Robert Duncan, Orkin Exterminating Co.; Ray K. Parks, Parks Exterminating Co. In essence, it was arranged that each firm would operate in monthly rotation on an advisory, applicating and result-checking basis.

My firm happened to be first in rotation so we decided to use Antu (Alphanapthylthiourea) on the first dumping area. One pound of Antu was mixed with every four pounds of finely ground corn meal (20 per cent), with an average of two ounces of bait blown into each accessible runway, 75 pounds of bait in all being used throughout the 5-acre dump.

Results proved most effective. On the evening of the second day (bait applications required a day and a half), dead rats by the hundreds were found; on the third day many mor rats were lying all over the dum sick and seeking the open air to di It was estimated a thousand rat (Norwegian) were exterminate some of which are shown in the en closed snapshot. (See cut below.)

Some of Roanoke's very dead rats, Antu-blitze

We enjoy reading PESTS and loo forward to receiving our copy eac month. —RAY K. PARKS

NO POISON — NO BAIT

WIZO
RAT GLUE BOARDS

"Once they step on they never step off."

A practical and economical way to rid buildings of rodent pests! No hazards of poisoned bait . . . or of decomposition! Easy to prepare! Just place WIZO Rat Boards near rat hole or form a runway next to walls. Fasten boards to floor to prevent pulling away. Rodents are caught firmly the moment they step on the boards.

WIZO RAT GLUE can be obtained in quantities for preparing your own boards. Write for complete particulars.

ELKAY PRODUCTS CO.
323-27 West 16th St New York, N. Y.

. . . See Yourself In Action . . .

How to be More Forceful in Selling Yourself To The Public

Why You Should Have This Book:

1. It is the only book of its kind offered to the public.
2. It will help you develop that power of force that lies within you.
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4. It will help you develop into a dynamic speaker, a quality that you never knew you possessed.
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Geigy

FACTS FROM THE SOURCE

DDT

Remember — it was Geigy who DISCOVERED the insecticidal value of *dichloro-diphenyl-trichloroethane (DDT)*

- It was in 1939 that the Geigy Company discovered the amazing insecticidal value of DDT.
- And Geigy has consistently pioneered in the work which followed—which has won for DDT insecticides such wide acclaim.
- Seven years of research and application places the Geigy Company in the position of leader in the DDT field.
- Processors can rest assured that Geigy's DDT *know how* can prove a decided asset in the production of effective, dependable insecticides.
- Geigy DDT has the highest para-para-isomer content of any technical grade DDT yet in production.
- Geigy NEOCID* DDT compositions are tried-and-proven formulations which can be used for further extension by spray and dust manufacturers with assurance of satisfactory consumer-products.
- Geigy offers full cooperation. And when you call on Geigy— you get DDT facts from the *source*.

*Reg. U.S. Pat. Off. Insecticidal Compositions containing DDT are covered by Reissue Patent No. 22,700.

GEIGY COMPANY, INC.

Originators of DDT Insecticides

89-91 BARCLAY ST., NEW YORK 8, N. Y.

TO ADVERTISE . . . AND HOW

"No Appreciable Results"

By **WILLIAM REA,** *New York Advertising Man*

HOW directly should my advertising begin to pay off? . . . is a question on which every merchant ponders at one time or many. Advertising has been called everything from a miracle to names which don't look well in print, but actually there is a large lack of understanding of how it works.

If John Q. Jones advertises that he has a stock of some scarce commodity —as men's white shirts have been through the war years—the tide of response is apt to be swift and high. Or if he offers a standard product for which there is a current need—at a bargain price, he is likely to see his stock cleaned out in record time. Such response is the natural reaction to "come and get it," when "it" is something scarce, much wanted or offered below its usual price.

But there is also the fellow who feels "there must be something to this advertising" and decides to give it a whirl. An Illinois druggist who had never advertised had a guilty feeling that in not doing so, he had been remiss. In the course of a dull summer he decided his business needed a stimulant and he resolved to start off on that long deferred advertising voyage. And so one afternoon just before press time, he barged into the local newspaper office with a scrap of wrapping paper on which was a much revised statement to the effect that he handled "the purest drugs and most healing medicines" to be had in that county.

Having decided to launch his campaign of advertising, he couldn't wait another day before starting. At some inconvenience the accommodating editor inserted his four line "reading notice" which, he rather reluctantly decided, might run four times. On the fourth day he phoned in that there has been "no appreciable results" and he wanted the ad discontinued. His investment of $1.60 had proved a total loss and so he was convinced that advertising didn't pay.

What ad-man hasn't run into cases quite similar to this one? Even small space, skillfully used, may bring profitable returns, but indifferently handled, it can be depended upon to prove a fizzle. Successful use of small space is too big a subject to go into here. It could well take up an entire article in itself.

Experiences like that of the druggist above might seem slightly humorous if they weren't also tragic—tragic in that a totally wrong approach—by one, who, however excellent in his own profession, was in no way qualified to write his own advertising—simply served to kill his own chances of the success that advertising properly used, brings to so many.

Earlier in this article, we referred to conditions under which an advertiser may expect immediate and highly satisfactory results from his effort and, of course, advertising frequently yields fine results starting with the first crack of the gun. But there is another angle also, which has applied in hundreds of cases of products which have become bywords in American households.

A brilliant advertising man put it something like this: The world is too big a place for most folks individually to really live in, so each of us lives and operates in a little world of our own, made up of the people and products and places we know. Unless you are a celebrity there are probably about 30 to 40 people you know well enough to hail by name, and about the same number of people know you. Similarly this little world of yours includes certain brands of merchandise—radios, cars, newspapers, linoleums, drinks, prepared foods, retail stores—and so on, which you feel you know something about and to which in a greater or less degree your patronage extends. Carry this simile further and we'll venture that you know six or a dozen vacation resorts, theatres, clubs or whatever else caters to your leisure and entertainment.

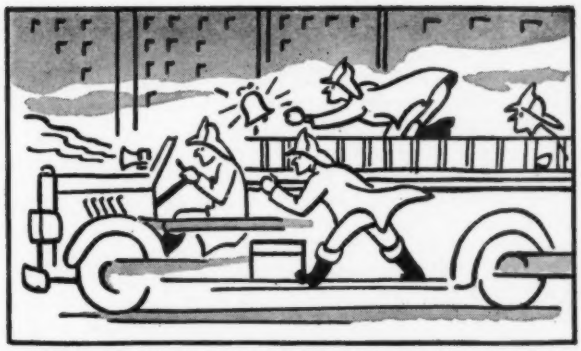
How did those products and places enter into the inner circle of your friendship? A hundred to one the answer is "through **advertising!**" You decide to have your house painted. The contractor submits a bid which includes the name of Sherwin-Williams or Devoe and Reynolds. You have no technical knowledge of paint. Its chemical constituents are a foreign language to you, yet you are favorably impressed. You have a feeling that paint made by either of these concerns is reliable—and no doubt it **is.** The plain fact, however, is that your friendly feeling for them and your confidence that they'll do a good job, results from the fact that you've seen them advertise — steadily, consistently, convincingly. It is entirely possible that John Jones & Company's paint would be even better, but you've never **heard** of John Jones' paint, so you pass it by in favor of one you've heard of and have come to recognize as a friendly name.

The first time you read the advertising of S-W or D.&R. Paints you didn't hurry around to your dealer to buy them. You waited until you had **need** of them. Yet, because in your case, as in thousands more, the advertising didn't effect a prompt sale, you certainly wouldn't say it wasn't a profitable investment. On some products and under certain conditions, there may be quite an interval between the sowing of the seed and the reaping of the harvest.

For years your wife has been exposed to the advertising of Armstrong's Linoleum. She cannot recall a line of what the last ad she read had to say. She doesn't remember a single headline of the scores of Armstrong ads she has read. Yet deep down she has a hunch that Armstrong's Linoleum makes a fine decorative and serviceable floor and if and when the time comes to refurbish her home or to build and outfit a new one —then Armstrong's Linoleum may well come first to her mind when she gets down to the matter of the floors. With thousands of people that advertising has produced "no appreciable results" **yet,** but the product has entered the inner circle of that little world of theirs and in due time they will remember that product and profit themselves and the manufacturer by installing it in their rooms or homes.

A young man seeking a job, or a business man desiring an easier approach to an important new prospect, asks a mutual acquaintance to write a letter of introduction. He knows that letter will make the approach easier, help establish a measure of confidence the "approachee' would hardly feel in a complete stranger. Similarly, advertising lifts your product out of the "stranger class," serves

Which form of DDT do you need?



POWDER THAT MAKES SPRAY IN A HURRY? Use Du Pont DEENOL 50-F. This 50% DDT wettable powder mixes quickly—is easy to apply—leaves minimum visible residue.

AN OIL-WATER SPRAY THAT DRIES CLEAN? Try Du Pont DEENOL 25-EM. When mixed with water, this 25% DDT miscible oil dries without noticeable residue.

DUSTING POWDER *LIGHTER* THAN A FEATHER? Even the lightest puff sends DEENOL 10-A into cracks and corners where sprays won't reach. A free-flowing dust—10% DDT.

A WATERLESS SPRAY THAT LEAVES NO MARKS? Try DEENOL 5-H, Du Pont's 5% DDT oil spray. It's ready to use—leaves invisible residue. No danger of water damage.

OR MAYBE THE "MAKIN'S" FOR YOUR OWN? Mixing finished sprays is *easy* with DEENOL 25-C, 25% DDT oil concentrate. Add other insecticidal ingredients if needed.

* * *

USE "DEENOL" DDT Insecticides designed by Du Pont especially for commercial application. Five different forms of DEENOL DDT cover all requirements. Their precise formulations, based on Du Pont research and experience, assure you of easy application—effective kill—and long-lasting insect control.

See your supplier today for DEENOL DDT insecticides. If he can't supply you, write direct to us and we'll send you complete information. Address your inquiry to E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Dept., (HM-2), Wilmington 98, Delaware.

DU PONT

DEENOL DDT

TRADE MARK

INSECTICIDES

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING

. . . THROUGH CHEMISTRY

as a letter of introduction which makes your salesman's call easier. He doesn't have to spend time introducing his firm and his product. That job has already been done—by the advertising. He can go more directly to the second part of his job—that of taking orders—and that's the part that puts dollars and cents into his pocket.

One-time advertising has been known to pay off in a big way, but the advertising that **establishes** products or services and gets them into that little individual world which everyone builds up around himself and his present and ultimate needs—the advertising that impels the buyer to take **your** product, rather than another even equally good, but of which he has not previously heard—the advertising that makes me, when my need arises, remember you as **the** fellow and your brand as **the** product that can probably deliver exactly what I want—that kind of advertising is planned and prepared with skill and carried on with patient persistence, even if the crop doesn't come in twenty-four hours.

Good advertising needs a chance to do its job and even bad advertising oftens yields big dividends if its stays on the job long enough.

Some of the Reasons for Keeping Cost Records

Here are some of the reasons why PCOs should keep a good record of their business. Time is coming when these reasons will tell who kept the best set of records and profited by the results that these records produced:

1. To see if you are making a profit.
2. To find out how much profit you are making.
3. What services that you do make the most profit.
4. To allow you to reduce your overhead and increase your profit.
5. Where your references for business come from and why.
6. What class of advertising pays you the best.
7. For reference for future business.
8. To know you are right when paying taxes.
9. What class of clients from reference pay you the best profit.
10. To find out the best time of the year to advertise.
11. To reduce losses and bad accounts.
12. Find loop-holes by which you lose good clients.
13. Always know where you are going and where you stand.
14. The stimulus to always do a little better the next year.
15. For the fun and interest it develops in your business.

—*P. C. O. News*

Instructions For Using ANTU (*Alpha-Naphthylthiourea*) as a Rat Poison

General Information

ANTU is an effective poison for the brown (Norway) rat but is not recommended for use against any other species of rat or other rodent. The outstanding features of this compound are a high toxicity for the brown rat and a relatively low toxicity for other species of wild rodents.

ANTU is a finely granulated gray powder. It is insoluble in water but soluble in some organic solvents including ethyl alcohol, acetic acid, dioxan and pyridoxine. It is chemically stable, non-volatile, non-toxic and non-irritating to the human skin. To some people, it has a bitter taste.

When compared with other rodent poisons, ANTU is one of the most efficient against wild Norway rats as shown in the following table:

TABLE I
Comparative Toxicities of Seven Rodent Poisons*

Stomach tube administration. Wild Norway rats.

Poison	Milligrams of poison per kilogram of body weight required to kill 50% of the animals.
1080	0.22 + or — 0.01
ANTU	6.9 + or — 0.5
Thallium Sulfate	15.8 + or — 0.9
Zinc Phosphide	40.5 + or — 2.9
Arsenic Trioxide	138. + or — 13.
Fortified Red Squill (females)	133. + or — 10.
Fortified Red Squill (males)	276. + or — 29.
Barium Carbonate	1,480. + or — 240.

**Data from S. Diecke and C. P. Richter, Johns Hopkins Hospital, Baltimore, Md.*

It should be noted that the toxicity figures in Table I apply to wild Norway rats. The figures may vary depending upon the rats used for the tests. The Fish and Wildlife Service thus give the following figures (LD 50): 1080, 4.0 to 5.0 mg/kg; thallium sulfate, 25 mg/kg; arsenic trioxide, 25 to 100 mg/kg (depending upon the degree of pulverization); fortified red squill, 300-400 mg/kg for females and 500-600 mg/kg for males; and barium carbonate, 700 to 750 mg/kg.

The following lethal dose figures for various animals and birds have been determined by stomach tube administration: (See Table II above).

Disadvantages inherent in ANTU include the rapid build-up of tolerance that follows the eating of less than a killing dose, its non-solubility in water and its lack of toxicity for rodents other than Norway rats. The development of tolerance to the poison by Norway rats is so rapid that ANTU cannot be used most effectively in a locality at intervals of less than one month; thus if additional control measures are necessary, some other effective rodent poison should be employed. A tolerance to many lethal doses can be built up within a few days. Likewise a rat poisoned but not killed by ANTU may subsequently refuse to touch bait containing ANTU for a period of up to six months.

TABLE II
Estimated Minimum Amounts of ANTU Required to Kill 100% (LD100) of Certain Animals and birds When Given by Mouth

Animal or Bird	Amount of ANTU in mg/kg of body weight
Laboratory rat, adult (Rattus norvegicus)	6-8
Norway rat, adult, wild (R. norvegicus)	10
Norway rat, young wild (R. norvegicus)	20-50
Domestic dog (Canis familiaris)	50
Pig (Suis scrofa)	50*
Roof Rat (R. Rattus subspecies)	250 or higher
Squirrel (S. Carolinensis)	50-250
Rabbit (Lepus)	400 or higher
Guinea pig (C. cobaya)	400
Domestic cat (Felis libyca domestica)	1,000*
Domestic chicken (Barred Plymouth Rock)	5,000*
Monkey (Macaca mulata)	5,000*

**Data from C. P. Richter only.*

Insolubility in water makes it more difficut to obtain even mixing of ANTU in bait and decreases its effectiveness as a water poison.

ANTU is acceptable to rats in 2-3 per cent concentrations. In these concentrations it may be considered more acceptable than red squill, less acceptable than thallium sulfate, and approximately equal in acceptability to 1080 and zinc phosphide. ANTU has a tendency to absorb odors, which will reduce its acceptability if the odor absorbed is unpleasant or gives warning to the rat.

Because dogs may eat lethal amounts of ANTU-poisoned grain or poisoned meat, care must be taken not to allow dogs to have free access to poisoned baits. Some evidence indicates that the same precautions may also have to be observed with pigs.

Continuing to give outstanding performance...

DU PONT SOIL COMPOUND NC *for Repelling Termites*

Du Pont Soil Compound NC has proved its ability to give greater and longer termite control than is usually expected of a soil treatment. It can add greatly to the effectiveness of your termite-control technique, too.

This oil-soluble organic compound is economical to use. Only four ounces are required per cubic foot of soil to give effective control. It is insoluble in water and does not leach nor seep with intermittent rainfall.

As a pest-control operator, you will find it valuable to be familiar with Du Pont Soil Compound NC and its remarkable resistance to termite attack.

Write today for detailed information. E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

ANTU has a much lower toxicity for cats so that these animals rarely are fatally poisoned. ANTU probably is not toxic to man but in the absence of definite knowledge, all necessary precautions should be observed. The high resistance of monkeys to the poison suggests that humans may likewise have a high resistance.

ANTU has been used widely in Baltimore for more than 3 years, in private residences, cellars, yards, public buildings, stores, etc., without any accidents to humans although domestic pets have occasionally been poisoned. Several thousand persons have handled ANTU mixed in bait without skin irritation or other signs of poisoning.

ANTU kills rats by causing an acute lung dropsy and an accumulation of fluid in the cest cavity. Death usually occurs within 12 to 48 hours. The first symptom is a sharp drop in body temperature.

Recommended Procedure for Mixing and Handling ANTU Baits

1. Keep it out of the mouth. Do not eat or smoke while handling ANTU. Keep personal contact at a minimum.

2. Keep all mixing equipment labelled plainly, wash it thoroughly after use, and do not employ it for other purposes.

3. Be certain that ANTU is **thoroughly and evenly mixed into the bait.**

4. **Wash your hands thoroughly** after mixing or distributing the poisoned bait.

Methods for the Use of ANTU As a Rat Poison

ANTU is recommended for use against the brown or Norway rat only. Five methods have been effectively employed:

1. In 0.75 to 3.0 per cent concentration (12 ounces to 48 ounces of ANTU per 100 lbs. of bait) in baits of the usual type. The higher concentration decreases acceptance but may be necessary to kill young rats.

2. Dusted lightly on and around freshly cut fruit or vegetables.

3. Dusted lightly on the surface of water or shaken up in water in 1 to 2 per cent concentration (1.3 to 2.6 ounces of ANTU per gallon of water.)

4. As a contact poison, using ANTU mixed 50-50 with an equal amount of flour or pyrophyllite and placed in patches on floors and in rat runways. This method is expensive but has been particularly successful in eliminating the last survivors in ratproofed buildings.

5. As a contact poison, by blowing ANTU into burrows and holes with a standard dust pump.

If good control of Norway rats does not result from the use of ANTU by any of the above methods, the trouble may lie with the bait or the method of application, rather than with the poison. Rats are cautious in the selection of baits and control methods must be adapted to local conditions. Because of prejudice against ANTU manifested by rats that have survived a first baiting, emphasis should be placed on a single but thorough operation. Local treatments often bring poor results when neighboring rats move on and off the poisoned area and thereby obtain only enough poison to prejudice them against further use of ANTU. To avoid such complications, ANTU treatments should thoroughly cover all parts of an infested area whether this be a ratproof building, a group of non-ratproofed buildings, or a city block.

The operating personnel must be reliable, competent and carefully instructed regarding necessary precautions and methods of placing the poison baits.

Do not expose baits or water containing ANTU where the poison might contaminate food supplies.

Place baits carefully near rat burrows and along runways, preferably behind boards or boxes or in specially prepared bait stations. In any case the baits should be out of reach of irresponsible persons, pets and other animals.

Confine all pets or remove them from the area to be poisoned. Remove and destroy all bait before releasing pets.

First Aid In Case of ANTU Poisoning

Produce vomiting by sticking a finger in the throat, by drinking warm mustard water or by other means. Keep the patient warm. **Call a physician immediately.**

For the Physician

ANTU causes acute pulmonary edema and pleural effusion in rats and dogs but these symptoms are lacking in some other animals. There are no direct data on symptoms in human beings. In rats and dogs the pulmonary edema is presumed to be the primary cause of death. The symptoms of acute ANTU poisoning in dags and rats are:

1. A sharp drop in body temperature within 30 to 60 minutes. The temperature may drop to 96°F within one hour and 88°F within the first four hours.

2. Increased blood sugar. The increase in blood sugar level occurs within 30 to 60 minutes and reaches a maximum in 4 to 6 hours.

3. Pleural effusion which usually appears after the third hour and reaches a plateau in 16 to 20 hours. Death is preceded by torpor and dyspnea.

In the event of ANTU poisoning the patient's stomach should be emptied by emesis or by a stomach pump. This should be followed by treatment for secondary shock.

Positive pressure breathing with oxygen is suggested for acute cases should edema develop. Massive intraperitoneal doses of cysteine up to 2,000 mg/kg have been effective in rats for counteracting the clinical symptoms and lethal effect of ANTU when administered soon after ingestion of the poison.

The recommendations presented in this brochure are those of the Subcommittee on Rodent Control of the National Research Council Insect Control Committee. They are based on information furnished by the Committee on Medical Research and the National Defense Research Council of the Office of Scientific Research and Development, the Johns Hopkins University, the U. S. Public Health Service, The Department of the Interior Fish and Wildlife Service, the Chemical Warfare Service, the U. S. Army Medical Corps, the U. S. Army Quartermaster Corps, the U. S. Army Engineers, the Texas State Board of Health and the British Commonwealth Scientific Office.

The field investigations involved in collecting the necessary data were sponsored and in some cases financed by the OSRD. ANTU for the field investigations was furnished by the Committee on Medical Research, OSRD. The most extensive field trials were conducted by Dr. Curt P. Richter of the Johns Hopkins School of Medicine and Dr. John T. Emlen, Jr., of the Johns Hopkins School of Hygiene and Public Health with the cooperation and financial support of the Committee on Medical Research, OSRD, and the City of Baltimore, Maryland.

For futher detailed information on ANTU, inquiries should be directed to the U. S. Public Health Service, the Division of Rodent Ecology of the Johns Hopkins School of Hygiene and Public Health, the U. S. Fish and Wildlife Service or to the various State, County, or City agencies responsible for rat control.

Permission is hereby given to reproduce or print this brochure either in whole or in part and under any letterhead desired.

3 DDT Preparations for the Insecticide Manufacturer

Today Penn Salt technicians are applying just as much effort and skill to the development of DDT as they did during the war. Only now their products are for all of us to use, and their purpose is not the stamping out of typhus in Italy but the controlling of insect pests here at home. A number of new preparations have recently been put on the market which are designed for the use of manufacturers creating their own formulations for domestic and farm insecticides. Here are three which may be just what you are looking for:

PENCO DB-50

—a specially compounded dry powdered dust base containing 50% DDT. This product is designed for use by insecticide manufacturers in the formulation of finished dusts for agricultural and household purposes.

PENCO SOLVENT CONCENTRATE

—a specially developed concentrate designed for use by insecticide manufacturers who do not desire to work from technical DDT. This product can be used for the manufacture of insect sprays.

PENCO DDT-TECHNICAL

—a fine to medium white granulated powder. It has a setting point of not less than 89° C. PENCO DDT-TECHNICAL is used by insecticide manufacturers who make their own formulations of DDT concentrates and finished products.

For prepared sprays use **PENCO WB-50**—a 50% DDT spray base.

PENCO EMULSION CONCENTRATE—a specially developed concentrate for use as a water emulsion spray where a minimum visual residue is desired.

PENCO CATTLE SPRAY—a dry wettable powder containing 50% DDT which is stable in water suspensions.

PENNSYLVANIA SALT MANUFACTURING COMPANY
Chemicals
1000 WIDENER BUILDING, PHILADELPHIA 7, PA.
New York • Chicago • St. Louis • Pittsburgh • Cincinnati • Minneapolis • Wyandotte • Tacoma

THE POETS' COLEOPTERA*

By **C. R. TWINN**, *Ottawa, Ont., Canada*

THE NAME Coleoptera, is from the Greek: koleon, a sheath, and ptera, wings; the insects with shethed wings. Typically the beetles are four-winged. The front pair of wings are horny or leathery and when the insect is not in flight meet along the middle of the back to cover the membranous hind wings: they also serve as protective armour for the body. In some species the hind wings are lacking and the fore wings or elytra may be fused together, and in a few others both pairs of wings are absent. E. V. Lucas, in **The Three-Halfpenny Traveller,** with poetic license likened the thickness of a postage stamp to that of a beetle's wing:

"A stamp's a tiny, flimsy thing,
No thicker than a beetle's wing,
And yet t'will roam the world for you
Exactly where you tell it to."

The mouthparts of beetles, both adults and larvae, are adapted for chewing. These insects have a complete metamorphosis. More than a quarter of a million species have been described by taxonomists, and probably a great many others are still unknown to science. They vary greatly in size, and measure in length from less than one-fiftieth of an inch, to slightly more than six inches; some of the smallest and some of the largest insects. In fact, the largest of the beetles is larger than the smallest of mammals, and the smallest is smaller than the largest protozoa. The various species or groups of species vary widely in habits and in their choice of food. Many of them are more or less harmless, while others range from minor pests to pests of great importance. Still others are beneficial because they prey on other species.

In this article nine families of beetles which caught the attention of English poets are considered; among these the Lampyridae are prominent, because of the poetic appeal of the fire-flies and glow-worms. The deathwatch beetles (Anobiidae) were also popular.

Family Carabidae: The Ground Beetles

This family of many species is an important one because a majority of its members are carnivorous both in the larval and adult form and prey on other insects. The larvae are elongate, active creatures, armed with a pair of pincer-like mandibles. They live an obscure life and are consequently less often seen than the adults. The beetles themselves are mostly plain black or brown in colour and may be observed running through the grass, or hiding under rubbish or stones. Many of them are incapable of flights, the elytra or first pair of wings being fused together, and the second pair atrophied. Others fly by night. It was undoubtedly one of the ground beetles that Carlyle referred to in the following lines:

"Poor hobbling Beetle, needst not haste;
Should traveller traveller thus alarm?
Pursue thy journey through the waste,
Not foot of mine shall work thee harm.
Who knows what errand grave thou hast,
'Small family'—that have not dined?
Lodged under pebble, there they fast,
Till head of house have raised the wind!"

Carlyle's impulse not to kill the beetle was a sound one in view of the insect's beneficial nature, but not for the sentimental reason that he gave. The "small family" could only consist of the larvae, which are very capable of finding their own food and do not depend on parental efforts. Some of these beetles and their offspring have been referred to as caterpillar hunters, and at least one species, **Calosoma sycophanta** L., owing to its prowess in this regard was imported from Europe into North America in large numbers some years ago, to assist in controllingthe caterpillars of the gypsy and brown-tail moths which are serious pests of forest and shade trees.

It was probably a ground beetle that Shakespeare had in mind in the passage in **Measure for Measure** (III.1), wherein he indicates that death is as painless for man as for the lowly beetle. Isabella fearing that her brother Claudio may quail in fear of death and prefer dishonour, tries to reconcile him to an honourable fate by saying:

"O, I do fear thee, Claudio; and I quake,
Lest thou a feverish life should'st entertain,
And six or seven winters more respect
Than a perpetual honour. Dar'st thou die?
The sense of death is most in apprehension;
And the poor bettle, that we tread upon,
In corporal sufferance finds a pang as great
As when a giant dies."

Doubtless a ground bettle was also meant in King Lear (IV.6), when Edgar said to his sightless father, the Earl of Gloucester, that so high was the Dover Cliff on which they stod that:

"The crows and choughs that wing the midway air,
Show scarce so gross as beetles:'

An interesting feature worthy of mention about certain species in this family is the ability of the beetles when attacked to discharge an ill-smelling caustic fluid from the hind end of the body in the direction of the attacker. In the so-called bombardier beetles (**Branchinus** spp.) this fluid suddenly changes into a gas on contact with air and becomes visible as a tiny puff of vapour, accompanied by and audible pop. These beetles might be considered the original artillerymen.

Family Staphylinidae: The Rove Beetles

The rove beetles are slender, elongate beetles characterized by very short wing-covers (alytra), which nevertheless conceal skilfully folded, well-developed and effective wings. There are numerous species most of which frequent decaying organic matter and prey on other insects. Thanks to its abbreviated wing covers, the rove beetle when alarmed can raise its abdomen in a threatening manner like a scorpion about to sting, and this has earned it the title of "the devil's coach-horse." Only one certain reference to it by the poets has come to hand, and that by Owen Meredith (Lord Bulwer Lytton) which runs:

"The toad told the Devil's-Coach-Horse,
Who cocked up his tail at the news."

Evidently the news was bad and startled the poor creature. However, among the guests at William Roscoe's **Butterfly's Ball and the Grasshopper's Feast:**

". . . there came the Beetle
So blind and so black,
And carried the Emmet,
His friend on his back."

Perhaps this was one of the myrmecophilous rove beetles, which normally live as guests in ants' nests, attempting to repay his host's hospitality. This, of course, is only an example of poetic license, for the lively ant would not willingly tolerate being transported in such a manner.

Family Coccinellidae: Ladybird Beetles

"Ladybird, ladybird, fly away home,
Your house is on fire, your children will burn."

The subject of this homely little rhyme, which has been repeated by generations of English children down the centuries, is a group of little hemispherical beetles red or yellow in colour with black spots, or black with red or yellow spots. These little beetles and their active larvae are very useful to man for they are carnivorous and prey on aphids and other soft-bodied insects. Lutz (5, p.298) suggests that the word ladybird goes back to the Middle Ages when the insects were dedicated to the Virgin and were known as "the beetles of Our Lady." If this is so, it may have been in recognition of their beneficial role in destroying injurious pests.

The ladybird has featured in a number of English rhymes, sometimes under other names. For instance, Drayton called the little beetle a "lady-cow" in **The Muses Elizium:**

"They shall be of the lady-cow,
The dainty shell upon her back,
Of crimson strewed with spots of black."

Under this name in English folk rhymes, the ladybird was supposed to have the power to direct little girls to their sweethearts (Northall, 6, p.119). The beetle would be tossed up in the air from the back of the child's hand while she chanted:

"Ladycow, ladycow, fly from my hand,
Tell me where my true love stands,
Up hill, or down hill, or by the sea-sand,
Ladycow, ladycow, fly from my hand."

Another version of this was given in **The Shepherd's Week** by John Gay in the early eighteenth century:

"This lady-fly I take from off the grass,
Whose spotted back might scarlet red surpass,
'Fly, lady-bird, north, south, or east, or west,
Fly where the man is found that I love best'."

In Sussex, the beetle, under the alias of Bishop Barnabee, was asked to go still further and set the date of the wedding, thus:

"Bishop, Bishop Barnabee,
Tell me when my wedding shall be,
If it be tomorrow day,
Ope' your wings and fly away."

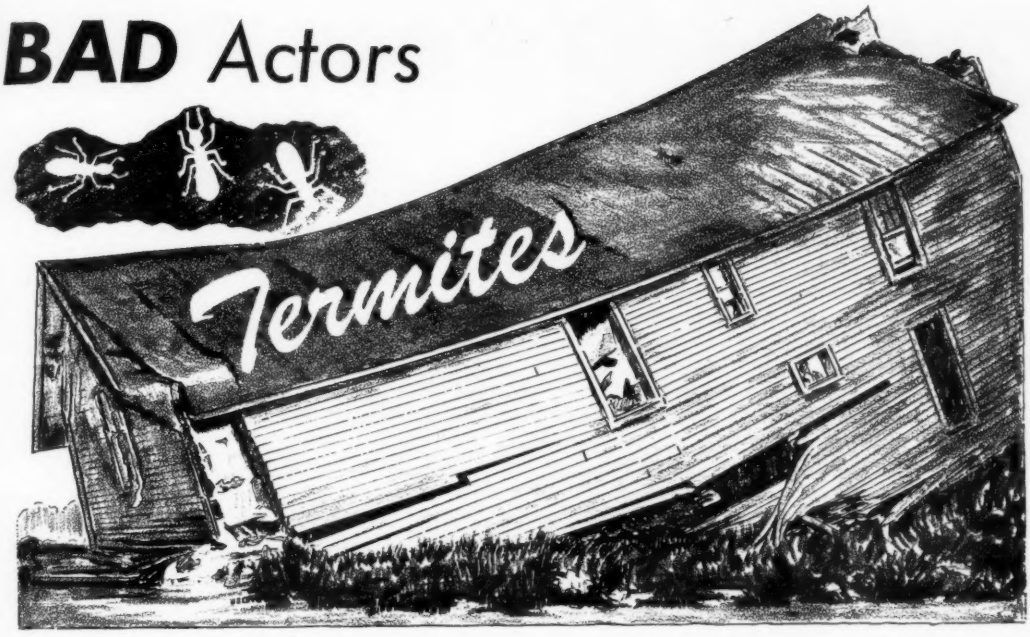
Family Lampyridae: The Fire-Flies and Glow-Worms

"The Fire-flies flit, and swarm, and throng,
Till all the mountain depths are spangled."
FAUST (II):SHELLEY

"Glories, like glow-worms, afar off shine bright,
But look'd too near have neither heat nor light."
THE WHITE DEVIL (IV.4): WEBSTER

*Contribution No. 2,425, Division of Entomology, Science Service, Department of Agriculture, Ottawa, Canada.

BAD Actors



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The tiny mysterious lights that flit and wink in garden and countryside during warm summer nights are produced by beetles of the family Lampyridae, nearly all of which possess photogenic organs. They are insects of medium or small size with bodies and wing-covers softer than is usual for beetles, andthe fore part of the thorax expanded in a thin margin which conceals the head. Concerning the location of the light-producing organs, Cowper wrote:

"Disputes have been and still prevail,
From whence his rays proceed;
Some give that honour to his tail,
And others to his head."
—THE GLOW WORM

There seem to have been no doubts on this matter in the mind of Michael Drayton a century and a half earlier, for he wrote that when fairy King Oberon lost his queen and thought she had been stolen by Pigwiggen, he set out in a terrible temper to find him. After scaring the wits out of a wasp:

"He next upon a glow-worm light,
(You must suppose it now was night)
Which, for her hinder part was bright,
He took her for a devil,
And furiously doth her assail
For carrying fire in her tail;
He thrashed her rough coat with his flail,
The mad king feared no evil."

Drayton, of course, was right, the organs in question are in the tail, or more correctly in the hinder segments of the abdomen. Both adults and larvae have the faculty of producing light, and even the eggs are luminous. This light, which is usually pale yellowish green, results from the oxidation of a compound called luciferin in the presence of an enzyme-like substance luciferase, practically without producing heat (Imm. 3, p. 105.) The probable function of this luminescence in the adult beetles is sex attraction, as romantically explained by James Montgomery:

"When evening closes Nature's eye,
The glow-worm lights her little spark
To captivate her favorite fly,
And tempt the rover through the dark.
"Conducted by a sweeter star
Than all that deck the field above,
He fondly hastens from afar,
To soothe her solitude with love."

It should be mentioned that the females of some species of Lampyridae are wingless and constitute the "glow-worm" of the poem. The larvae, too, are called by this name. The winged males and females are the "fire-flies."

A good proportion of the allusions probably refer to the common European species, **Lampyris noctiluca,** the female of which is larviform and without wings. That Shakespeare knew of it is shown in several of his works. In **Hamlet** (I.5), for example, the Ghost emphasizes the urgency of his departure on the approach of morning by saying to Hamlet:

"Fare thee well at once!
The Glow-worm shows the matin to be near,
And 'gins to pale his uneffectual fire:
Adieu, adieu! Hamlet, remember me."

And in **Midsummer Night's Dream** (III.1) the bewitched Titania orders her fairies to feed and take care of Bottom and to this end to:

"Steal from the humble-bees,
And for night-tapers crop their waxen thighs,
And light them at the fiery glow-worm's eyes,"

a quite impossible task in view of the heatless nature of the glow-worm's light, which, as already pointed out, is in the abdomen, not the eyes. One other allusion is to be found in **Venus and Adonis** (I.103), in the vivid and horrific description of the wild boar given by Venus in her anguished efforts to dissuade Adonis from taking part in the hunt.

"On his bow-back he hath a battle set
Of bristly pikes, that ever threat his foes;
His eyes like glow-worms shine when he doth fret;
His snout digs sepulchres where'er he goes;"

John Lyly, in his Epilogue to **Campaspe,** mentioned the glow-worm when repeating a baseless, and probably ancient, superstition to the effect that:

"where the glow-worme creepeth in the night
no adder will goe in the day."

Some allusions to the glow-worm and fire-fly in English poetry and drama undoubtedly refer to species common in warmer parts than England, such as in the Mediterranean region. This applies to most of the references found in the works of Shelley, Byron and Browning, all of whom spent part of their lives in Italy. However, the following from Shelley's **To a Sklark** may relate to an English species:

". . . a glow-worm golden
In a dell of dew,
Scattering unbeholden
Its aerial hue
Among the flowers and grass which screen it
From the view."

William Cowper wrote a charming poem in which an English glow-worm played a leading role. This short poem, entitled **The Nightingale and the Glow-worm,** is worth repeating in its entirety because of the beauty of its sentiment:

"A nightingale, that all day long
Had cheered the village with his song,
Nor yet at eve his note suspended,
Nor yet when eventide was ended,
Began to feel, as well he might,
The keen demands of appetite.

When, looking eagerly around,
He spied far off, upon the ground,
A something shining in the dark,
And knew the glow-worm by his spark;
So, stooping down from hawthorne top,
He thought to put him in his crop.
The worm, aware of his intent,
Harangued him thus, right eloquent—
'Did you admire my lamp,' quoth he,
'As much as I your minstrelsy,
You would abhor to do me wrong
As much as I to spoil your song.
For 'twas the selfsame power divine,
Taught you to sing, and me to shine;
That you with music, I with light,
Might beautify and cheer the night.'
The songster heard his short oration,
And warbling out his approbation,
Released him, as my story tells,
And found a supper somewhere else."

Of course, unless the glow-worm was a larva and therefor of either sex, the poet's specimen would have been a female and not a male, as indicated in the poem. If it were a larva, it was not appealing to the nightingale for clemency on the basis of "do unto others as you would have them do unto you." For these creatures are carnivorous and feed upon slugs and snails, seizing the unfortunate molluscs with sharp pincer-like mandibles.

The works of Keats contain four allusions to the glow-worm, of which two are given here. In **Endymion** (II.141) he wrote that:

". . . beneath the evening's sleepy frown
Glow-worms began to trim their starry lamps,"

and in **Cap and Bells** (XXIV.9) pointed out that the gaslights of the retail merchants repel the powers of darkness,

"And supersedeth quite the use of the glow-worm"

In his well-known **Scorn Not the Sonnet,** Wordsworth likened the sonnet to a glow-worm lamp:

"The sonnet glittered a gay myrtle leaf
Amid the cypress with which Dante crowned
His visionary brow; a glow-worm lamp,
It cheered mild Spenser, called from Faery-land
To struggle through dark ways;"

In **An Evening Walk,** Wordsworth wrote of a swan with young, that:

"Oft has she taught them on her lap to lay
The shining glow-worm; or in heedless play,
Toss it from hand to hand, disquieted;
While others, not unseen, are free to shed
Green unmolested light upon their mossy bed."

A further allusion is in **The Primrose on the Rock:**

"A Rock there is whose homely front
The passing traveller slights;
Yet there the glow-worms hang their lamps,
Like stars at various heights;"

Tennyson apparently was interested in the lampyrids only in the function of similitudes, if one is to judge from the following quotations:

". . . the Pleiads, rising thro' the mellow shade,
Glitter like a swarm of fireflies tangled in a silver braid."
—LOCKSLEY HALL

". . . below
No bigger than a glow-worm shone the tent
Lamp-lit from the inner."
—THE PRINCESS (IV.25)

'And the glow-worm of the grave
Glimmer in thy rheumy eyes."
—THE VISION OF SIN (153)

Several English poets have written about exotic forms of the fire-fly beetles. In the Mediterranean region both sexes are winged and, contrary to what one would expect, the light of the male is more brilliant than that of the female. Doubtless Shelley and Browning were writing of southern European species in the following. The first two quotations are from Shelley:

"In circles quaint, and ever-changing dance,
Like winged stars the fire-flies flash and glance
Pale in the open moonshine, but each one
Under the dark trees seems a little sun,
A meteor tamed; a fixed star gone astray
From the silver regions of the milky way.
—GISBORNE (297-285)

But when daylight came the:

"Fireflies were quenched on the dewy corn,
Glow-worms went out on the river's brim,
Like lamps which a student forgets to trim:"
—THE BOAT ON THE SERCHIO

As one of the attractions up at the villa, Robert Browning wrote that:

"Some think fireflies pretty, when they mix
i' the corn and mingle,
Or thrid the stinking hemp till the stalks
Of it seem a-tingle."
—UP AT THE VILLA—DOWN IN THE CITY

The fire-flies of the East Indies were observed by Sir Francis Drake in the latter part of the sixteenth century. This is described in Hakluyt's Voyages, in "The Famous Voyage of Sir Francis Drake into the South sea, and therehence about the whole

FUMIGATION NEWS

JULY *Published in the interest of Pest Control Operators and the use of*
AERO BRAND HCN DISCOIDS AND CYANOGAS
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If windows are in good condition but inclined to be open between upper and lower sash, small wooden wedges should be inserted to draw them together—but only hand tight. Wooden wedges are inexpensive and are available at most 5 and 10¢ stores, hardware or furnishing stores. When using these wedges, however, be sure that one or two windows on each side of each floor can be opened easily to facilitate airing procedure.

Sealing material for industrial buildings, where appearances are of secondary importance, usually consists of flour paste or Fox paste and strips of medium-weight wrapping paper. Such paper can be obtained from any local paper supply house in two or three-inch widths. For sealing around doors, a mixture of four parts asbestos and one part calcium chloride with enough water to make a stiff dough has been used successfully.

In cases where the office is included in fumigation and there is objection to using paste and paper on the windows, a masking tape, as used on automobile painting jobs, may be used. This consists of a roll of paper tape having an adhesive material on one side. This tape adheres fairly well to wood, steel, stone or painted surfaces, and may be peeled off readily without damaging the surface. Such masking tape is also appropriate for use in sealing domestic dwellings. Masking tape is available in rolls of varying sizes and widths, and is not expensive. The widths most generally used are one-inch and two-inch.

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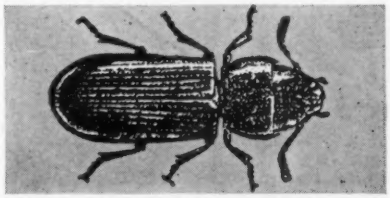
Confused Flour Beetle

The adult confused flour beetle is about one-sixth of an inch long, and of a dark, reddish brown color. The eggs, when first laid, are covered with a fluid to which particles of flour, meal, etc., adhere. At favorable temperatures the eggs hatch in about a week to small wormlike larvae. Again with favorable temperature and food, the larvae grow to maturity in about three weeks. The pupa stage consumes approximately ten days, making the total time from egg to adult about forty days.



The Confused Flour Beetle. *Courtesy U.S.D.A.*

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Globe of the earth, begun in the yeere of our Lord, 1577," as quoted by Weiss (8):

"Our General considering the great distance, and how farre he was yet off from his Countrey, thought it not best here to linger the time any longer, but waying his anchors, set out of the Island, and sayled to a certaine little Island to the southwards of Celebes, where we graved our ship, and continued there in that and other businesses 26 dayes. This Island is thoroughly growen with wood of a large and high growth, very straight and without boughes, save onely in the head or top, whose leaves are not much differing from our broome in England. Amongst these trees night by night, through the whole land, did shew themselves an infinite swarm of fiery wormes flying in the ayre, whose bodies beeing no bigger than our common English flies, make such a shew and light, as if every twigge or tree had bene a burning candle."

These may be the kind sometimes referred to as "lantern-flies," a name which has also been used in the West Indies. A description of them by Champlain in his account of a voyage to the West Indies and Mexico in 1599 was quoted from Hakluyt by Phipson (7, p.403):

"There is a kind of little animal of the size of prawnes, which fly by night, and make such light in the air that one would say that they were so many little candles. If a man had three or four of these little creatures, which are not larger than a filbert, he could read as well at night as with a wax light."

When Sir Thomas Cavendish and Sir Robert Dudley first landed in the West Indies they saw (vide Mouffet) in the evening a great number of moving lights in the wood. These, of course, were fire-flies, but due to their ignorance of such insects, the Englishmen took them for Spaniards advancing upon them and withdrew to their ships. Southey has described the spectacle presented by these luminous nocturnal fliers in the following verse:

". . . Sorrowing we beheld
The night come on; but soon did night display
More wonders than it veil'd: innumerous tribes
From the wood-cover swarm'd, and darkness made
Their beauties visible: one while they stream'd
A bright blue radiance upon flowers that closed
Their gorgeous colours from the eye of day;
Now motionless and dark, eluded search,
Self-shrouded! and anon, starring the sky,
Rose like a shower of fire."

Anobiidae: The Death-Watch Beetles

"These dull abortive sounds that fret the silence
With puny thwartings and mock opposition!
So beats the death-watch to a sick man's ear."
—REMORSE (IV:1):COLERIDGE

Many of the species in this family are borers in dry wood, both as adults and larvae, and certain of them at times cause serious damage to woodwork in houses and furniture. In general they are rather small, cylindrical or oval-shaped beetles. The species usually referred to as the "death-watch" is **Xestobium rufovillosum** DeB., although the name is also applied to allied forms. The ticking of the death-watch is caused by the beetles in their burrows tapping their heads against the wood. It occurs in the spring months and apparently is a sexual call, but among the superstitious has been taken as a forewarning of the approaching death of a member of the household. Thus, Thomas Campbell in the **Dirge of Wallace:**

"And the lady of Elderslie wept for her lord
When a death-watch beat in her lonely room,
When her curtain had shook of its own accord;
And the raven had flapped at her window-board,
To tell of her warrior's doom!"

And Keats in **Endymion** (IV.531):

". . . within ye hear
No sound so loud as when on curtain'd bier
The death-watch tick is stifled."

Tennyson, too, made several allusions to the death-watch with telling effect. For instance, in **Forlorn:**

"You that lie with wasted lungs
Waiting for your summons . . .
In the night, O the night!
O the death-watch beating!"

Again in **Queen Mary**, he referred to:

"Nights in the Tower; dead—with the fear of death—
To a dead ev'n for a death-watch;"

and, in the pathetic Conclusion of **The May Queen**, he put into the mouth of the dying girl the following words with their message of hope:

"I did not hear the dog howl, mother, or the death-watch beat,
There came a sweeter token when the night and morning meet;"
"All in the wild March-morning I heard the angels call;
It was when the moon was setting, and the dark was over all;"

The death-watch beetles are likely to be most numerous in very old houses, of which there are many in England, and in such places goblins and ghosts might be expected to lurk by those who believe in or fear the supernatural. Such a place, with

"Haunted old rooms . . .
Where death-ticks knock and mouldering panels

was described by Masefield in **The Death Rooms.**

The rational intellect of Dean Swift would have none of this superstition, and more than 200 years ago he poked fun at it in verse and revealed its cause and suggested a cure. He described the death-watch as:

". . . a wood-worm
That lies in old wood, like a hare in her form:
With teeth or with claws it will bite or will scratch,
And chambermaids christen this worm a death-watch:
Because like a watch it always cries click:
Then woe be to those in the house who are sick!
For, sure as a gun, they will give up the ghost,
If the maggot cries click, when it scratches the post;
But a kettle of scalding hot water ejected,
Infallibly cures the timber affected:
The omen is broken, the danger is over,
The maggot will die, and the sick will recover."

There are other species of beetles besides the death-watch which tunnel in wood products. Among them are the so-called powder post beetles (family Lyctidae) which cut cylindrical burrows in dried wood, reducing it to powder in the process. Sometimes they may not be discovered until the wood is ready to collapse, but usually their presence is revealed by the fine "sawdust" ejected from their exit holes. In the following selections the allusions may concern one or more of several wood-boring species.

The decrepit tavern which Tennyson's **Enoch Arden** sought down by the quays had:

"A front of timber-crost antiquity,
So propt, worm-eaten, ruinously old,
He thought it must have gone;"

And Thomas Hardy commented bitterly in **An Ancient to Ancients:**

"Where once we danced, where once we sang,
Gentlemen,
The floors are sunken, cobwebs hang,
And cracks creep; worms have fed upon
The doors. Yea, sprightlier times were then
Than now, with harps and tablets gone,
Gentlemen!"

Many people have a favourite easy chair. Thackeray's was an old cane-bottomed one which he commemorated in verse. It was of more value to him than "the finest of couches that's padded with hair," in spite of the fact:

"'Tis a bandy-legged, high-shouldered, worm-eaten seat,
With a creaking old back and twisted old feet;"

The tragic story of the awful chest which trapped the young bride with its spring-lock when she prankishly hid in it from her husband on her wedding day, so that she disappeared forever from his ken, is described in Samuel Rogers poem, **Ginevra.** Long after her disappearance her picture still hung:

"Over a mouldering heirloom, its companion,
An oaken chest, half eaten by the worm,"

and the despairing husband had long since gone to war and been killed in battle:

"Full fifty years were passed, and all forgot,
When on an idle day—a day of search
'Mid the old lumber in the gallery,
That mouldering chest was noticed; and t'was said
By one as young, as thoughtless as Ginevra,
'Why not remove it from its lurking place?'
T'was done as soon as said; but on the way
It burst, it fell; and lo! a skeleton."

Thus, the grave of the unfortunate bride was revealed by the beetles' destructive work.

The family Anobiidae includes certain species of beetles that are also destructive to books. There are several allusions in the works of the poets to "book-worms" and "moths" damaging books and manuscripts. In Spenser's **Faerie Queene** (II.9.57), Sir Guyon's host, the "Old Man Eumnestes," was described as older than "Mathusalem" and:

"His chamber all was hangd about with rolls
And old records from auncient times derivd,
Some made in books, some in long parchment scrolls,
That were all worm-eaten and full of canker holes."

According to an account in Wallace's "Life and Works of Burns" (p.308), the latter once on visiting a nobleman was shown into the library where he found a beautifully bound, but apparently unread, copy of Shakespeare badly worm-eaten. He thereupon penned the following epigram and inserted it in the book, where it was found long after his death:

"Through and through th' inspired leaves
Ye maggots, make your windings;
But O, respect his lordship's taste,
And spare the golden bindings!"

Besides beetles and their larvae, the primitive insects known as silverfish, Lepismidae, which belong to a different order, often damage books and papers, as they are fond of materials containing starch and glue. Perhaps the word "moth" in Burns' **Epistle to James Smith** refers to them.

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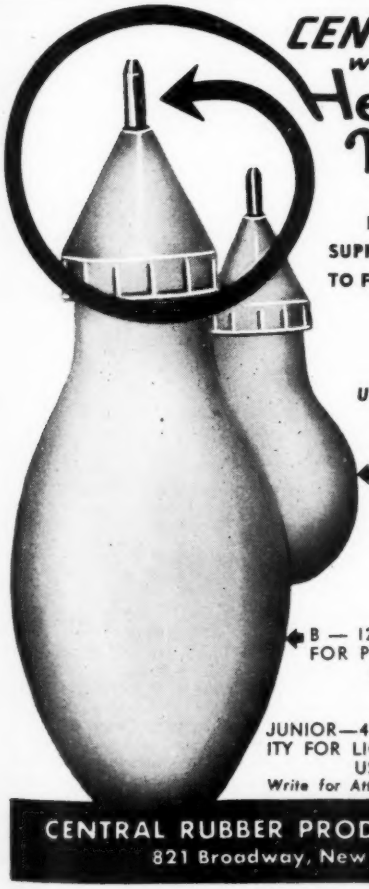

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Far seen in Greek, deep men o' letters
Hae thought they had ensur'ed their debtors,
A' future ages;
Naw moths deform, in shapeless tatters
Their unknown pages."

A somewhat similar allusion occurs in Pope's **Essay on Criticism:**

"Some on the leaves of ancient authors prey,
Nor time nor moths e'er spoiled so much as
as they;"

Family Chrysomelidae: The Leaf-Beetles

The leaf-beetles, which comprise an extensive and economically important family, appear to have been largely overlooked in English poetry and drama. This is somewhat surprising as they are found feeding on the leaves of a wide range of plants and includes in their number some very injurious pests. A familiar example in North America is the Colorado potato beetle, **Leptinotarsa decemlineata** Say, a chunky, oval shaped beetle with yellow wing covers striped with black. Before the arrival of the white man this species was confined, until about 1855, to the southern Rocky Mountain region, where it fed on wild plants related to the potato. With the establishment and spread of potato culture man provided the beetle with an unlimited food supply, and it spread eastward throughout the United States and Canada. Subsequently it found its way through commerce to several localities onthe European continent where its advent was greatly feared. It has not yet gained a footing in England, where restrictive legislation is enforced to prevent its introduction. Burr (I, p.188) records, however, that following a potato beetle scare some fifty years ago it was caricatured on the English stage. This was in a pantomime played in 1887 in the provinces. Burr states that "the Demon King came on the stage dressed in black and yellow stripes, the appropriate livery, and sang:

"Take care of your little potatoes, boys!
And all your tiny spuds.
Just watch your jolly cauliflowers
And all your fuchsia buds.
You'd better hide your bread and cheese,
And everything you've got,
For the Colorado beetle's come,
To collar the jolly lot!'"

Family Curculionidae. The Weevils

This family, also, is very large and includes probably more than 30,000 described species in the world, of which a number, such as the grain weevils and various species that bore into trees, roots, blossoms, fruits, etc., are responsible for great damage and loss. A distinctive characteristic of all weevils is the prolongation of the head into the form of a snout or beak which has earned them another popular name, to wit, snout beetles. This snout is often used to bore holes in which to deposit the beetles' eggs. The snout of the curculios which attack nuts is long and slender. The legless, maggot-like larvae feed on the nut kernels.

Shakespeare may have referred to the work of one of these species in **As You Like it** (III.4). Celia, when Rosalind was distressed because her lover Orlando had not come to her in the forest, unkindly remarked that:

"for his verity in love, I do think him as a
covered goblet or a worm-eaten nut."

Or, in other words, worthless. In a rather ill-chosen simile Keats likens the curculio larva to a scorpion. This is in **Otho the Great** (V.5.156), wherein Ludolph says of his wife:

"Even as the worm doth feed upon the nut,
So she, a scorpion, preys upon my brain."

When infested nuts fall to the ground from the trees, the curculio grubs leave them and burrow into the earth, where they pass the winter and pupate and emerge as adult beetles the next summer. This was evidently not known to Erasmus Darwin, as may be seen by scanning the following lines from one of his poems:

"So sleens in silence the Curculio, shut
In the dark chamber of the cavern'd nut:
Erodes with ivory beak the vaulted shell,
And quits on filmy wings its narrow cell."

Actually, the beetle never occurs inside the nut and, moreover, its beak is not ivory, but black.

Family Lucanidae: The Stag Beetles

The rather odd popular name of the beetles in this family derives from their very large mandibles (jaws), which in certain species are branched somewhat like the antlers of a stag. The flattened, whitish grubs thrive in decaying wood and, in some species at least, persist for several years before pupating in a cell made up of the coarse "sawdust" from their gnawings. In view of the formidable appearance of the head of the stag beetle with its massive jaws, it may have been one of these that Pigwiggen wore as a helmet when setting forth on chivalrous adventure, as described by Michael Drayton in **The Court of Fairy:**

"His helmet was a beetle's head,
Most horrible and full of dread,
That able was to strike one dead,
Yet it did well become him;
And for a plume a horse's hair,
Which being tossed up by the air,
Had force to strike his foe with fear,
And turn his weapon from him."

Perhaps one of the functions of these large mandibles is to strike fear into the enemies of the beetle, because the greater their size, the less efficient they seem to be for biting purposes.

Family Scarabaeidae: Chafers, Scarabs, June Beetles, Etc.

"The scaly beetles with their habergeons,
That make a humming murmur as they fly."
—THE SAD SHEPHERD (II.2):
BEN JONSON

The species in this large family of beetles vary considerably in size, appearance and habits. Typically, however, they are rather stout-bodied insects with wing covers (elytra) which do not quite cover the abdomen. Familiar examples are the cockchafers or June beetles which are often common in the spring and fly bunderingly past one in the dusk or come tap-tap-tapping at the lighted windows. Perhaps it was one of these that De La Mare wrote of in **The Ravens Tomb;**

"Summon the haunted beetle,
From twilight bud and bloom,
To drone a gloomy dirge for me
At dusk above my tomb."

An English local name for the European cockchafer, **Melolontha vulgaris**, is "buzzard-clock." Tennyson used it in **Northern Farmer, Old Style**, in the following lines wherein the farmer describes the parson's sermon in rather uncomplimentary terms in northern English dialect:

"An' I hallus comm'd to 's choorch afoor moy
Sally wur dead,
An' 'eard 'um a bummin' away loike a buzzard-
clock ower my 'ead
An' I niver knaw'd whot a mean'd but I thowt
a 'ad summut to saay,
An' I thowt a said whot a owt to 'a said an' I
coom'd awaay."

The stoutish grubs of these beetles spend three years in the soil where they feed on the roots of pasture grasses and cultivated crops, often causing important damage. The beetles themselves feed on the foliage of deciduous trees.

A closely allied group are the dung beetles, called "dor" beetles in England. A well-known species is **Geotrupes sterorarius** L. They dig tunnels in the earth either under or near animal excrement, and place a plug of the latter in the bottom of each and lay an egg in it. The dung serves as food for the grubs. These beetles are large and rounded in form, and produce a humming sound in their clumsy flight. Kirby and Spence (4,p.221) suggest that this is the "shard-borne beetle" referred to by Shakespeare. The allusion occurs in **Macbeth** (III.2), when the latter tells Lady Macbeth that although Banquo and his son Fleance still live, "There's comfort yet; they are assailable;" . . . and:

"Ere the bat hath flown
His cloister'd flight; ere to black Hecate's
summon
The shard-borne beetle, with his drowsy hums,
Hath rung night's yawning peal, there shall be
done
A deed of dreadful note."

Thomas Gray, in the second stanza of his famous **Elegy Written in a Country Churchyard**, also mentions this species.

"Now fades the glimmering landscape on the
sight,
And all the air a solemn stillness holds,
Save where the beetle wheels his droning flight,
And drowsy tinklings lull the distant folds;"

The cockchafer is evidently a familiar creature in England, for several other poets have alluded to it. Indeed, the entomologists Kirby and Spence recorded that it may "be heard in all places almost every fine evening in summer." Gray's contemporary, William Collins, referred to the above or an allied species in this fine descriptive verse from an **Ode to Evening:**

"Now air is hush'd save where the weak-eyed bat,
With short shrill shriek, flits by on leathern wing,
Or where the beetle winds
His small but sullen horn,
As oft he rises 'midst the twilight path,
Against the pilgrim borne in heedless hum:"

There can be no doubt that the poets were fully aware of the nocturnal habits of the beetles, for Tennyson wrote in **Claribel** that:

"At eve the beetle boometh
Athwart the thicket lone;"

but when day awakened, as pointed out by Shelley in **The Boat on the Serchio:**

"The beetle forgot to wind his horn,"

Everyone has heard of the sacred scarab beetle of the ancient Egyptians, **Scarabaeus sacer.** They placed them in the tombs and painted or carved their image on the sarcophagi containing the noble dead. Hence the name of the genus and of the family. These beetles belong to a group known as tumble-bugs, because of their habit of forming balls of dung and rolling them to suitable spots and burying them, some for their own sustenance and others, each containing an egg, for the larvae that hatch therefrom. Sometimes two beetles work together in rolling the ball of dung. This was observed and recorded by Robert Browning in his poem **Caliban Upon Setebos.** Caliban:

"Sees two black painful beetles roll their ball
On head and tail as if to save their lives:"
Moves them the stick away they strive to clear."

In his "Introduction to Entomology" Comstock (2) states that from this beetle and its habits "the Egyptians evolved a remarkable symbolism. The ball, which the beetles were supposed to roll from sunrise to sunset, represented the earth; the beetle itself personified the sun, because of the sharp projections on its head, which extend out like rays of light; while the thirty segments of its six tarsi represented the days of the month. All individuals of this species were thought to be males, and a race of males symbolized a race of warriors. This later superstition was carried over to Rome and the Roman soldiers wore images of the sacred beetle set in rings."

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USDA Entomologist Receives Typhus Award

Secretary of Agriculture Clinton P. Anderson on May 13 presented the United States of America Typhus Commission Medal to Edward F. Knipling of the Department's Bureau of Entomology and Plant Quarantine. The presentation was made at 2:30 p. m. in the presence of Brig. Gen. S. Bayne-Jones, Director of the Typhus Commission, who read the citation accompanying the medal.

Mr. Knipling received the award for his scientific contributions toward the control of insects responsible for spreading typhus. As senior entomologist in charge of the USDA laboratory at Orlando, Fla., during the war, he helped to develop methods for control of insects of most concern to our military forces at home and abroad. Through his knowledge of medical entomology Mr. Knipling and his associates developed and adapted for military application practically all insecticides and repellents used by the armed forces. Among these products were DDT compounds which gave almost complete protection against the human body louse transmitting typhus, and dimethyl phthalate for the control of scrub typhus.

"These studies, enlarging scientific knowledge, led to the effective use of DDT in the control of epidemic typhus fever . . . " the citation read. "Mr. Knipling's contributions served as a basis for preventive measures which were highly effective in protecting troops from disease and in controlling epidemics among civilian populations."

The United States of America Typhus Commission Medal was established by the late President Franklin D. Roosevelt in an executive order dated December 24, 1942. The Commission serves with the Army of the United States and comprises representatives of the Army, Navy and Public Health Service.

Patio Restaurants in New Orleans

Fifth of a series of articles on N.P.C.A.'s 1946 Convention City—Ed.

To eat and drink in New Orleans, in any of the numerable patio restaurants is a novelty; for eating and drinking in New Orleans is a fine art and is one of the arts that keeps the flavor of the past vitally alive. Year after year, the older institutions go on, in the same buildings and the same atmosphere, serving the famous Creole dishes in undiminished excellence.

New Orleans Creole cuisine, evolved many years ago, has as its basis French delicacy, augmented by Spanish pungent seasoning, Indian herbs, and the skill of Negro mixing and baking. From the very first, New Orleans has always had a diverse food supply of both staples and delicacies from Europe.

New Orleans restaurateurs scour far countries of the earth for certain important ingredients for their dishes. New Orleans having taken the trouble to concoct its delicious, many-tasting foods, may raise a quizzical eyebrow at the occasional spinach eater who happens along, but to the appreciative gourmet she extends a joyous welcome. This spirit of gracious catering is found in all the restaurants, as well as the more humble hostelries.

Orleanians have always been a people who preferred to "dine out" whenever possible and with such an abundant supply of restaurants on hand it is always easy for the men and women to foregather in the dining rooms or cool patios of the celebrated restaurants and partake of the food that has given a national reputation to the city that was once known as the "Paris" in America.

Unquestionably, one of the most interesting patio restaurants in the old French Quarter of New Orleans is the Patio Royal, 417 Royal Street. The handsome structure was erected during the twilight of the Spanish rule over Louisiana by Don Jose Faurio, a wealthy merchant of that period, on a site long owned by Don Vicente Rillious. A long, flagstone paved passageway leads from the street into the patio. The stairs which lead to an inner door in this pasageway are an object of art. There is no other similar type of construction in New Orleans and visiting architects admire the graceful spiral.

The courtyard or patio is paved with large flagstones, not unlike the passage and is centered through an arched doorway that forms part of the thick structure of the house. Potted plants are scattered about in profusion and the great urns that are used now as pots were originally containers for olive-oil that was imported into the colony generations ago. Large amber lamps light the courtyard at night and they are typical of the French lantern that was used to light the streets of Paris a few centuries ago. The balcony extends over the courtyard and is lined wtih the little doors that led to the slave quarters.

The restaurant has an atmosphere of charm and grace that is so typical of the patio restaurants in New Orleans. The food is excellent and the cuisine is Creole.

Made famous by the many pictorial reproductions made of its deep and handsome courtyard, "The Court of the Two Sisters" has become one of the most popular of the patio restaurants. Built in 1832 by Zenon Cavelier, who was president of the Banque d'Orleans, the site had been owned by Antoine Cavelier, one of the early settlers of the city.

The courtyard gained its strange name from the fact that two sisters, Emma and Bertha Camors, for twenty years, 1886 to 1906, there conducted a fancy and variety store. Sister Emma was Mrs. Raphael Musso, and Sister Bertha married Victor Anguad, son of Emile Anguad, the boot and shoe merchant, who owned the building.

The establishment is similar in many respects to the Patio Royal. A long flagstone walk or passageway runs from the arched front gate along the side of the house to the patio. Halfway along this passage is a unique fireplace, built by the early homeowner for outdoor cooking during warm weather. The bricks of the building, as well as those of the fireplace, are old and crumbling. The antique lanterns that light the patio are modeled after those in Paris, large and made of lacy iron. The arches are high, almost as high as the third story and are closed by great grilled gates.

Visitors are always charmed while dining by the splashing of the fountain in the courtyard and lulled to contentment by the cool breeze in the giant weeping willow tree that shades the courtyard. The numerous slave quarters in the tiers of balconies that jut out over the patio form an interesting and unique background for the entire setting, cuisine and hospitality

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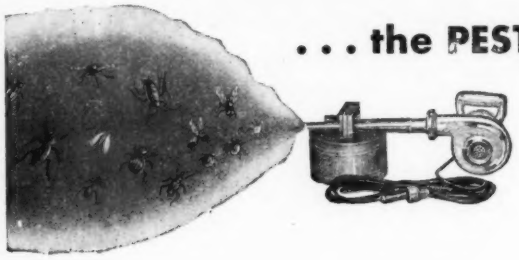

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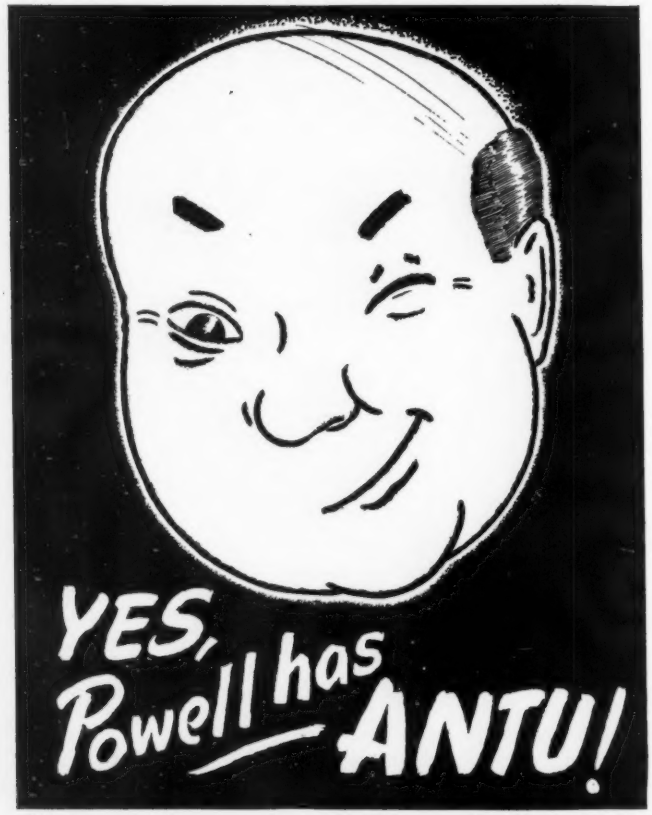

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of this patio restaurant at 615 Royal Street.

Few buildings can boast an antiquity which exceeds that possessed by a quaint one-story structure with green shutters at 710 St. Peter Street —it is the "Green Shutter" restaurant, one of the most charming and graceful dining patios in New Orleans.

This restaurant with the green shutters was built before 1796 by Don Lorezo Cachet, and here he lived until his death. Well in its second century the building is cool and charming with large windows shaded by heavy batton shutters that are painted a soft green.

A unique feature of the "Green Shutter" is the manner in which the floor of the dining room has been paved with soft red bricks. The room has a very quaint atmosphere of charm and quiet dignity. The tables are tiny and neatly placed; and, in all, the room is one that would inspire a fine meal.

The courtyard beyond is shaded by a towering brick building next door whose outer wall serves as the wall of the patio. It is a maze of creeping, green vines that blend in pleasing contrast with the soft red brick. The rear building which served as slave quarters is directly above an arched passage that leads to the rear of the patio. Inside the arch, built into the wall, is one of the curiously wrought fireplaces that allowed the families of old New Orleans to prepare meals in the open during warm weather.

The brick of the building is very old and is crumbling into soft red powder along the base of the walls, making a colorful unintentional decoration for the structure.

A promenade on Bourbon Street will bring visitors to a street that crosses that thoroughfare. It is Conti Street and at 819 is the celebrated Broussard's Restaurant, a favorite with visitors.

The building that it occupies is not very old when compared with other buildings down in the French Quarter, but they do occupy the site of that famous institution of learning, Jefferson Academy. Broussard's patio is large and cool and the atmosphere of fine foods and service prevails. There cuisine lives up to the traditions and high standards set by Creole cookery.

Most of the patio restaurants in New Orleans cater to visitors as well as native Orleanians and there are always little courtesies extended that make the New Orleans restaurants famous the world over for their excellent cuisine, their charming old-world atmosphere, and the extended hospitality. For an enjoyable meal in a romance-drenched setting, the patio restaurants of New Orleans rival those of Europe.

LOCAL ORGANIZATION NEWS

Eastern Pennsylvania Pest Control Association

The quarterly meeting of the Eastern Pennsylvania Pest Control Association was held on June 11, 1946 at the Benjamin Franklin Hotel in Philadelphia. Guests of the evening included Robert Thomas and William Dilks of the Lower Merion Township Board of Health and Ernest Mills of the Fish and Wild Life Division, U. S. Department of the Interior.

The business meeting was called to order by President "Bud" Sharp. Mr. Sharp reported that his committee was very well received at Pennsylvania State College and that they were very anxious to cooperate and to inaugurate a short course for PCO's in entomology at the college. However, the committee was having some difficulty in setting a date, and further reports will be forthcoming at our next meeting.

Mr. Martin Meyer introduced a motion that the Constitution and By-Laws Committee draw up an amendment to admit representatives of allied industries to limited membership in the association. The committee is to report on this amendment at the next meeting.

The next meeting of the association will be held in Wilkes-Barre, Pa. on September 10, 1946 at which time William O. Buettner, Secretary of the National Pest Control Association will be one of the guest speakers. For those who can arrive at Wilkes-Barre earlier in the afternoon a trip through the anthracite mines is planned.

At the close of the business session the group was entertained by a motion picture "Respect the Law" presented by Messrs. Thomas and Dilks. The motion picture was instructive as well as entertaining, and dealt with the enforcement of city ordinances for rodent control.

The outstanding feature of the evening was a lecture by Ernest Mills on the use of DDT, ANTU and 1080 as rodenticides. Mr. Mills covered briefly the history and development of these chemicals followed by a resume of the latest experiments being carried out by his office. There was no doubt that those present benefited greatly from the lecture, and Mr. Mills was very gracious in answering many questions at the completion of his talk.

There were thirty Pest Control operators present representing the following companies:

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Carl L. McClure
Bauer Exterminating Company
Mr. Morris J. Perinchief, Penna. Salt Co.

Respectfully submitted,
—John G. Vogel, Chairman,
Public Relations Com.

Quebec Pest Control Operators Association

On May 31 there was organized in Montreal, P. Q., the Quebec PCO's Association.

One of the objectives that the Association is endeavoring to accomplish is to study ways and means to create better relations with both Municipal and Provincial Sanitary Officials.

Officers elected were as follows: Guy Favreau, President; Andy Lefebvre, Secretary; Fred Leighton, Treasurer; Bill Kornpointner, Director, and Al Friedman, Director.

New England Pest Control Assn.

Edward W. Gallagher, assistant manager of the Boston Better Business Bureau, gave the principal address at the meeting of the New England Pest Control Association at the Hotel Lenox, May 22, 1946.

Mr. Gallagher talked on "Public Relations" and stressed the need of the Pest Control Industry making itself known to the public. He suggested "glamorizing" our Code of Ethics to make it more suitable for publicity, news releases in the name of the association on pest control items of public interest, talks by members of the Association before Womens' Clubs and Civic organizations.

The Legislation Committee reported that the proposed Pest Control Legislation is "dead" for the present session of the Legislature but that they have hopes of winning its passage in the session beginning next January.

The Abalene Exterminating Co., Inc., of Pittsfield was voted into membership.

Philip P. Wallace and S. S. Ellsworth of the Ensign Bickford Co. of Avon, Conn., spoke of their new product, "Cordacide-DDT Dispenser."

Hart Harris, Jr., of the S. B. Penick & Co. introduced his boss, Mr. R. P. Neptune.

It was voted that the June meeting will be the last of the season.

Submitted by,
Kenneth N. Cook, Secretary

HOW TO KILL RATS DEBATED IN HOUSE OF COMMONS

14-Day Sentence for Using Boiling Water Raises Issue

LONDON—The House of Commons devoted a few minutes of question time today to discussing how to kill a rat.

Home Secretary J. Chuter Ede refused to remit a sentence of fourteen days at hard labor imposed on a man who caught a rat in a cage and killed it by pouring boiling water on it. Ede said the man pleaded guilty to causing the rat unnecessary suffering.

M. Follick, Laborite, said this was a common method of killing rats and that he had never heard of a humane method.

"Rat destruction is not my department," answered Ede. "There may be no humane way of killing rats, but the method used in this case was undoubtedly inhumane."

—N. Y. Herald-Tribune

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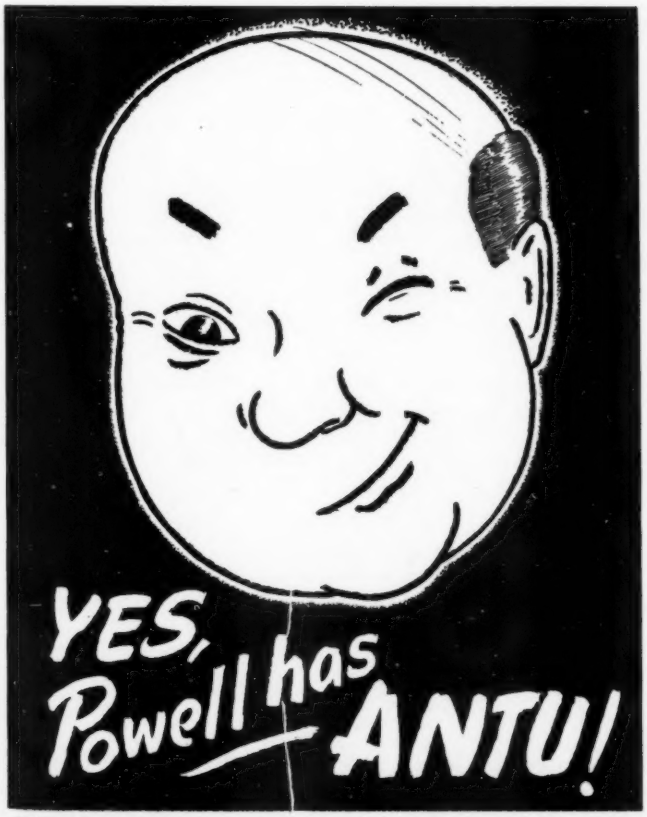

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Progress Report on the Mill Infestation Problem

Read at Joint Meeting of Districts 1 and 2 of the A.O.M., Manhattan, Kansas, April 27, 1946

By R. K. DURHAM

IF ALL the printed literature on the subject of grain and flour mill insects and the methods for controlling infestation was laid end to end, it would certainly establish some kind of a record. There is a saying that those who can, do—and those who can't, teach. It is one thing to write about how to control insect infestation, but doing the job is not so simple as it may seem to the teachers. We might as well be realistic and openly admit that present methods employed to rid mills of insects are discouragingly inadequate. One large milling company states that it costs $22,000 for a general fumigation of one of its largest plants. An expenditure of that amount of money should logically be supposed to result in a perfect kill. But does it? No! It may be safely stated that no general mill fumigation destroys 100 per cent of insect life within the area fumigated.

The reasons are known but not easily corrected. Here are the principal ones: (1) mill buildings are not properly constructed to prevent leakage of the fumigating gas; (2) in almost every mill structure are unknown, inaccessable or overlooked places where dust or flour or intermediate mill stocks accumulate to such a depth that insects therein are not reached by the gas; (3) inside of nearly every mill machine are cracks, or ledges, or dead-ends, or dead spouts where flour may lodge and provide refuge for insect life; and (4) the perfect fumigant has yet to be discovered.

There appears to be good evidence that filled sacks of flour, feed, or intermediate products, bales of empty sacks, or sacks of grain, may be subjected to methyl bromide vapors in a well constructed fumigation chamber, and that if the prescribed amount of gas and exposure are used, all insect life will be destroyed. If, on the other hand, an attempt is made to fumigate an entire mill, the leakage of gas through cracks around windows and doors or other openings, and even through walls is so great that with conventional procedure it is impossible to build up a sufficiently high gas concentration to result in a perfect kill. Neither hydrocyanic acid gas or chloropicrin is any better. It is possible that people who do the fumigating have not studied well enough the weaknesses of these gases. For example, it is claimed that results obtained by a relatively low level of gas concentration with long exposure are equal to those obtained when high gas concentration with short exposure is used. Has anyone tried a carefully controlled experimental fumigation to determine what level of gas concentration could be maintained without too much leakage, then by introducing successive shots of gas, maintain that level for the desired exposure time? Even though existing methods or machines for doing a job are admittedly inadequate, it is almost always possible to utilize them to better advantage if the user will but dig in and thoroughly analyze the situation.

It is well known that a flour mill becomes reinfested much too soon following a general fumigation. We blame (1) the wheat, (2) the unwise paths over which screenings are handled, (3) use of second hand bags, or (4) flour which is often fed into the system. And these are logical avenues of contamination, but I firmly believe that if a new, more effective fumigant or an improved procedure, using now commonly employed fumigants, should be discovered, which, when used for general fumigation, would make the mill absolutely free of insect life, the miller could devise ways to keep it almost insect free for several months. Electrical and mechanical methods are now available which may prove capable of accomplishing that desire. Extensive and carefully obtained experimental or applied data to substantiate claims made for such insect destroyers would be most welcome.

D.D.T. is an old chemical, which during the war received considerable publicity when it was found to possess insecticidal value. The publicity given to D.D.T. was based upon its reputation for killing flies, mosquitoes, sandflies and moths when they are in the flying stage. Furthermore, to be most effective against those insects, D.D.T. is mixed with a fast-acting knockdown agent, such as pyrethrum, rotenone or thiocyanates. Very little data is available on which to base an opinion on the value of D.D.T. as a flour mill insecticide. Just because it has been called the miracle insect eradicator, millers should not get the impression that by simply spraying it all around the mill, warehouse, sackroom or boxcars, insect troubles will disappear. Tests thus far reported on the use of D.D.T. to control flour mill insects have generally been too meager and haphazard to justify conclusions reached and claims made. Searching, fundamental, organized and carefully controlled laboratory experiments must be conducted to learn (1) best solvent or suspending medium to carry D.D.T.; () best concentration to use; (3) most effective amount of residual deposit; (4) effect of kind of surface treated, such as rough wood, smooth wood, brick, plaster, metal, concrete, etc.; and (5) effect of dust film on the treated surface.

The effect of D.D.T. on man and animal is a much debated subject, and until more is known about its toxicity, great care should be practiced in using it around food plants. The danger may come from promiscuous, wasteful, unintelligent and ineffective use of the stuff. Not until some agency conducts the above mentioned laboratory study, can the miller intelligently use D.D.T.

A very serious attempt is being made to perfect an insect proof, or insect repellent flour sack. Progress has been reported, but unfortunately most of the effective chemicals are frowned upon by Food and Drug people. During the war, various agencies were secretly engaged in a study of chemicals having insect repellent properties which could be used to impregnate fabrics from which soldiers' clothing was made. Studies were also made to prolong the effectiveness of such repellents in fabrics by the use of fixatives. The results of that secret research are now being "declassified" and released for public consumption. Dimethyl phthalate was found to be an effective mosquito repellent.

Chemically inert, very hard substances, such as magnesium oxide, when pulverized to a very fine dust and mixed with wheat at a rate of about 0.1 per cent by weight, have been found to be effective for protecting it from insects. It is thought that sharp edges of the dust particles break the waterproof fatty covering of the insects, and death results from the escape of body moisture. If moisture content of the grain is below 8 per cent, the dust has been found quite effective. As moisture content

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increases above that figure, the dust is reported to become less and less useful. Such dusts might be appropriately used in stored seeds, but have doubtful possibilities for use in wheat stored for subsequent milling.

From India comes a report that mercury coated copper sheets have been used for the prevention of insect damage to stored grain. The coated sheets are said to give off mercury vapor which prevents the eggs from developing into larvae and also kills small sized larvae.

In the October 13, 1945, issue of CHEMISTRY and INDUSTRY, an English publication, appeared an article describing a new insecticide said to possess merit either as a stomach poison, contact agent of fumigant. It is called "666" or "gammexane." It is also referred to as benzene hexachloride. The author claims that dusts applied to the grain, giving a concentration as low as one part per million of wheat, have proved toxic to grain weevil. No effect could be detected in flour milled from the treated wheat or in the loaves made from the flour. He further states that gammexane gives off a vapor so that it becomes a lethal fumigant at room temperature. It is claimed to be much more toxic to weevils than D.D.T. Benzene hexachloride is rated at seven times more effective against flies than D.D.T. according to a statement appearing in a trade paper.

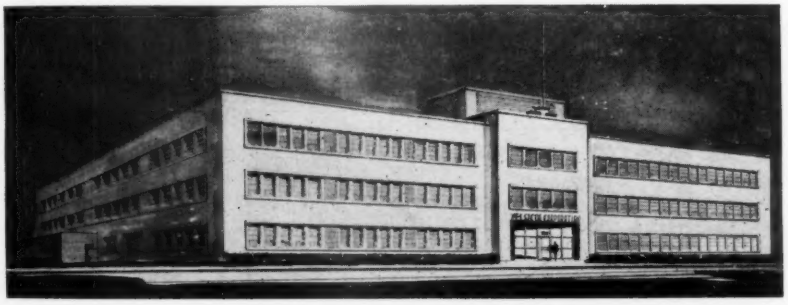
The Velsicol Corporation of Chicago has recently announced its newest insect toxicant — Velsicol 1068 — claimed to be three to five times as toxic to insects as D.D.T. The fact that Velsicol 1068 causes death to insects with less exposure time seems justification for serious consideration by the milling industry.

The problem of insect control in mills is recognized by the Technical Committee of the Millers' National Federation as the one to be given top priority for study by the Director of Technical Service. The people in the milling industry want to do a better job of freeing their plants from insects and are eager to learn about newer or better methods. No one realizes more than I, the inadequacy of present procedures, and I shall endeavor to make it possible for millers to do a much better job of controlling insects.

A JUMPING SPIDER, when it misses its objective, draws itself back to its perch by a safety line which issues from its spinnerets as it jumps and which hardens upon being exposed to the air.

Velsicol Corporation's New Office and Laboratory

Architect's drawing of office and laboratory building now under construction at 320-348 East Grand Avenue, Chicago, Ill., for the Velsicol Corporation, manufacturers of Insecticides, Resins, Aromatic Solvents, Core Oils, and other chemical products of petroleum derivation. The building, which will be completely air-conditioned, will provide the most modern facilities, including a pilot and instrumentation laboratories, for Velsicol's growing research and technical staffs. This is part of an expansion program planned to promote new production goals and new production development. Features of the new building will be the specially equipped entomology and small animals laboratories where research on entomological and other biological problems will be conducted. Velsicol Corporation now employs over 50 chemists and assistants at its present location, 120 East Pearson Street, Chicago, Ill. The Corporation's most recent development is the new insect toxicant Velsicol 1068 ($C_{10}H_5Cl_5$) which has been demonstrated to be from 3 to 5 times as effective as DDT in the control of many species of insects.



NAIDM Meets in French Lick June 17-19

The thirty-second mid-year meeting of the National Association of Insecticide and Disinfectant Manufacturers was held in French Lick, Ind., June 17-19. Program talks included:

"Uniform Insecticide Regulation," S. R. Newell, Assistant Director, Production & Marketing Administration, Department of Agriculture, Washington.

"Aerosol Marketing," L. W. Ward, Sparklet Devices, Inc.

Forum on "Insecticide Problems"—Leader: Ira P. MacNair, MacNair-Dorland Co., Inc.

"Toxicity of DDT Sprays on Livestock," Dr. H. S. Telford, Dr. Hess & Clark, Inc.

"The Kettering Report," Dr. Victor Froelicher, Geigy Company, Inc.

"A Synopsis of Experimental Work on the Toxicity of DDT," Dr. Paul A. Neal, medical director, and Dr. W. F. von Oettingen, chief industrial toxicologist, Industrial Hygiene Research Laboratory, Public Health Service, Bethesda, Md.

"Chemistry of Today," L. F. Livingston, E. I. du Pont de Nemours & Co., Wilmington, Del.

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(Classified)

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Replies to advertisements where box number only is indicated should be addressed c/o PESTS, 1200 Oak St., Kansas City 6, Mo., giving box number as well.

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MANAGER large reputable New England firm. Must possess thorough knowledge of pest control business. $100 weekly, plus bonus. Box 7, Pests.

Read About The N.P.C.A. Convention

In the OCTOBER Issue of PESTS and Their Control

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Phosphorous, however, remains basic in the compound because it is the most toxic chemical used in pest exterminating, being more toxic than arsenic, strychnine or thalium. Approximately one-tenth of a grain will kill a rat. Phosphorous is a slow poison, taking from 6 to 18 hours to kill. Due to its slow but positive action, the rat succumbs to this poison. He becomes very uncomfortable and, seeking fresh air and water, in most cases, leaves the premises and dies in the open.

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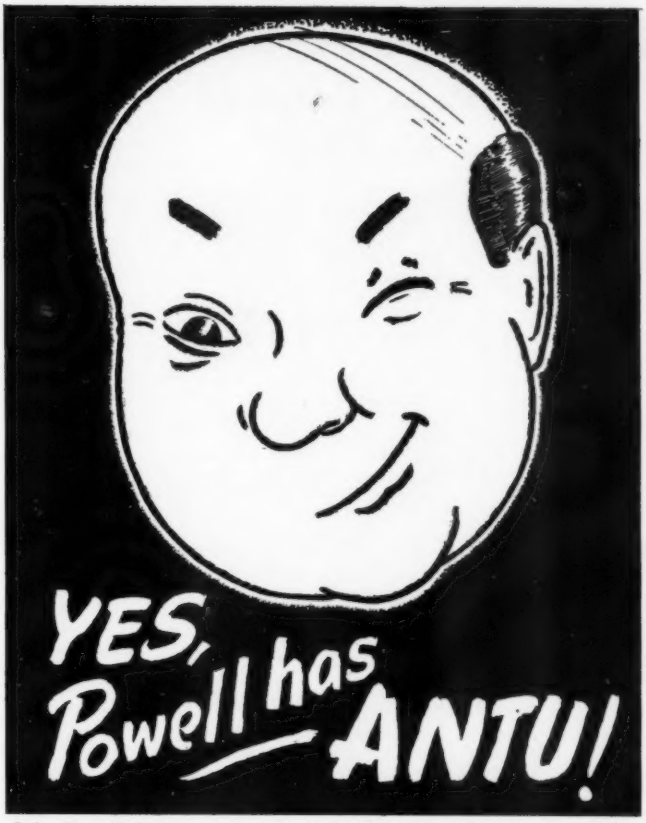

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W. B. HILL, Patentee. MEMPHIS, TENN.

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Additional Patents Relating to Pest Control

By **DR. R. C. ROARK**

2,395,315 (Feb. 19, 1946; appl. Aug. 29, 1941). N-HYDROCARBON SUBSTITUTED PYRROLIDINE SALTS OF MONO-NUCLEAR DINITRO-PHENOLS. Edgar C. Britton and John N. Hansen, Midland, Mich.—The Dow Chemical Company, Midland, Mich. The N-normalbutyl-pyrrolidine salt of 2,4-dinitro-6-cyclohexylphenol is an insecticide.

2,395,440 (Feb. 26, 1946; appl. May 6, 1941). INSECTICIDAL AND FUNGICIDAL COMPOSITIONS. Arthur Donald Ainley and William Harris Davies, Blackley, Manchester, England.—Imperial Chemical Industries Limited.—An insecticidal and fungicidal composition contains as an essential active ingredient a formaldehyde-ammonium aryl dithiocarbamate interaction product obtained by reacting formaldehyde with an ammonium aryl dithiocarbamate having the formula RNH-CS-S-NH_4 in which R is aryl, in the proportions of at least one mole and not more than 6 moles of formaldehyde for each mole of amomnium aryl dithiocarbamate in a cooled aqueous solution. and a carrier therefor.

2,395,453 (Feb. 26, 1946; appl. Feb. 26, 1944). beta-THIOCYANO KETONES AND METHOD FOR THEIR PREPARATION. Herman A. Bruson, Philadelphia, Pa.—Rohm & Haas Company, Philadelphia, Pa.—The patentee claims as a new compound, an addition product of thiocyanic acid and an aliphatic ketone having a double bond between carbon atoms in the alpha,beta- position, said product being a beta-thiocyano ketone. These compounds are useful as insecticides.

2,395,454 (Feb. 26, 1946; appl. Sept. 12, 1944). THIOCYANO ALIPHATIC ETHERS OF HYDROXYDIHYDRONORDICYCLOPENTADIENE. Herman A. Bruson, Philadelphia, Pa.—The Resinous Products & Chemical Company, Philadelphia, Pa.—The thiocyano aliphatic ethers of hydroxydihydronordicyclopentadiene are high boiling liquids which are useful as toxicants in insecticidal compositions.

2,395,455 (Feb. 26, 1946; appl. Jan. 13, 1945). DIHYDRONORPOLYCYCLOPENTADIENYL ISOTHIOCYANATES. Herman A. Bruson, Philadelphia, Pa.—The Resinous Products & Chemical Company, Philadelphia, Pa.—The sprays made from isothiocyanates of

2,395,635 (Feb. 26, 1946; appl. Feb. 11, 1944). RODENT GUARD FOR GANG-LANKS. Charles H. Matson, New York, N. Y.

2,395,827 (Mar. 5, 1946; appl. July 3, 1945). AIRPLANE SRPAY UNIT. Chester N. Husman and Olin M. Longcey, Orlando, Fla.—United States of America, Secretary of Agriculture.

2,395,989 (Mar. 5, 1946; appl. Sept. 11, 1943). QUATERNARY AMMONIUM NITROPHENATES. Louis H. Bock, Huntingdon Valley, and Alva L. Houk, Philadelphia, Pa.—Rohm & Haas Company, Philadelphia, Pa.—These compounds make efficient mildew-proofing compositions.

2,396,012 (Mar. 5, 1946; appl. Mar. 9, 1945). INSECT REPELLENT COMPOSITIONS. Howard A. Jones and Bernard V. Travis, Orlando, Fla.—People in the United States.—A method of repelling insects comprises applying to the area from which the insects are to be repelled an insect repellent composition containing 2-ethyl-n-caproic acid as its essential active ingredient.

2,396,013 (Mar. 5, 1946; appl. Mar. 9, 1945). INSECT REPELLENT COMPOSITIONS. Howard A. Jones and Bernard V. Travis, Orlando, Fla.—People in the United States—An insect repellent composition comprises 2-phenylcyclehexanol incorporated in a carrier.

2,396,054 (Mar. 5, 1946; appl. May 30, 1942). INSECTICIDES. Orville E. McKim, Port Chester, N. Y.—Stanco Inc.—An insecticidal solution comprises 0.2% to 2.0% pyrethrins I and II and 95% to 80% of isopropyl alcohol and 5% to 20% of kerosene.

2,396,264 (Mar. 12, 1946; appl. Jan. 22, 1944). FUNGICIDE. Max N. Huffman, Woodworth, Wis.—U. S. Standard Products Company, Woodworth, Wis.—The patentee claims a chemical compound, which comprises a 4-chloro-3, 5-dimethylphenyl hydrogen camphorate. This can be administered externally by means of any suitable vehicle for the treatment of human fungus infections, such as, for example, the disease commonly known as athlete's foot.

2,397,191 (Mar. 26, 1946; appl. Aug. 23, 1943). SPREADING AGENT. Percy Meyer, Ottawa, Ontario, Canada.—Shell Development Company, San Francisco, Calif.—This invention relates to a new spreading agent for oil on water for use in mineral oil insecticidal compositions.

2,397,384 (Mar. 26, 1946; appl. June 2, 1944). PRODUCTION OF 1, 1-DICHLORO—1-NITROALKANES. John B. Tindall, Terre Haute, Ind.—Commercial Solvents Corporation, Terre Haute, Ind.

—Calendar of Meetings—

Secretaries of Pest Control Associations, as well as others planning meetings of pest control interest, are invited to send date and place of such meetings for listing in this column. To insure maximum publicity in advance of the meeting, such information should be sent at the earliest possible time.

Construction Industries Exposition and Home Show, Pan Pacific Auditorium, Los Angeles, Calif., July 12 to 21, 1946. Applications for booths may be made to D. D. Durr, c/o Tabery Corp., 3443 S. Hill Street, Los Angeles 7.

Alabama Pest Control Association, semi-annual meeting, September 14 (tentative), Admiral Semmes Hotel, Mobile, Ala. A. S. Krawcheck, Orkin Exterminating Co., Inc., 101 S. 20 Street, Birmingham 3, Ala.

National Pest Control Association (14th Annual Convention), Roosevelt Hotel, New Orleans, La., October 28, 29, 30, 1946.

American Public Health Association (annual meeting), Cleveland, Ohio, week of November 11, 1946. Exhibits will be featured. Willimina Rayne Walsh, Associate Secretary, 1790 Broadway, New York 19, N. Y.

National Association of Insecticide and Disinfectant Manufacturers, 33rd annual meeting, Hotel Commodore, N. Y., December 2, 3, 4 (tentative).

HANDBOOK OF PEST CONTROL

The Behavior, Life History and Control of Household Pests

By ARNOLD MALLIS

This new book is a thoroughly practical, complete and up-to-date study of pest control which will be invaluable to every insecticide manufacturer, pest control operator and entomologist. Approximately 570 pages in length, and containing 140 illustrations, it deals in a practical way with the behavior, life history and control of household pests.

While there have been other books in this field, Mr. Mallis' book is by far the most complete and up-to-the-minute practical text on the subject. It reflects insecticide developments as recent as those of the past few months, carrying for instance, the most recent findings on DDT, aerosol insecticides, insect repellents, etc. The emphasis throughout is on control measures, and the author covers fully all the commonly used insecticide materials and treatments. Fumigation is the subject of a special chapter.

An unusually complete list of references to the literature on household pests, insecticides and their use adds considerably to the value of Mr. Mallis' new book. Hundreds of references to the technical literature are listed.

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8	Dry Rot Fungi	21	Spiders
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12	Clothes Moths		
13	Hide and Carpet Beetles	26	Household Fumigation

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Pests.....$6.00, Plus Postage

Now! **DDT AND LETHANE A-70**

Compounded with new diluents that permit FREE, SMOOTH FLOW of powder from Bulb Type Duster or Mechanical Equipment.

SEBONITE-D-2

Combines Quick Kill of Lethane A-70 With Residual Action of DDT.

containing

10% DDT

10% LETHANE A-70

TON LOTS	31½c per lb.
500 LBS.	35c per lb.
100 LBS.	38c per lb.

SEBONITE

Has very low order of toxicity plus **QUICK KILL**

CONTAINING 10% LETHANE A-70

TON LOTS	28c per lb.
500 LBS.	31½c per lb.
100 LBS.	34c per lb.

10% DDT POWDER

TON LOTS	14c per lb.
500 LBS.	14½c per lb.
100 LBS.	16c per lb.
50 lbs.	20c per lb.

TERMS—F.O.B. PHILADELPHIA, PA.

SALES MAY BE ARRANGED ON CONTRACT BASIS

Special Send for 5 lb. sample offer at 100 lb. price

SEABOARD MFG. LAB., INC.

Tulip and Dauphin Sts. Philadelphia 25, Pa.

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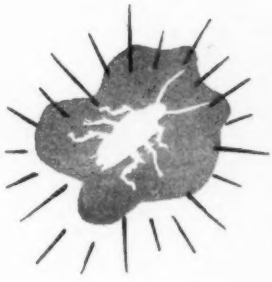

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LETHANE A-70

***and* DDT**

The New, *Fast* Combination Powder For Getting Rid of Roaches

It's speedy and it's powerful. It's an insecticide combination that's hard to beat. Works with equally efficient killing power on ants, bedbugs and silver-fish.

Powders based on this LETHANE A-70 and Rohm & Haas DDT combination are easy to handle...permit the use of bulb-type dusters or mechanical equipment. Write us for the name of your nearest supplier.

LETHANE is a trade-mark, Reg. U. S. Pat. Off.

ANOTHER DEVELOPMENT OF ROHM & HAAS INSECTICIDE RESEARCH

WRITE FOR THESE BOOKLETS

The latest helpful, technical and business releases, issued by manufacturers and supply houses servicing the industry, are available, without cost, by writing the sponsors indicated. Where no supply source is indicated, please write Pests and Their Control, 1200 Oak Street, Kansas City 6, Mo.

ELECTRO SPRAYER

The electro sprayer as shown in ad on page 11 of this issue weighs 12 pounds when filled and ready for use. Operates on 115 volt AC or DC outlet. Thermostatically controlled magnetic switch. Flash boiler principle produces instant super heated dry steam. Precision built. Requires no lubrication. Scientifically designed ceramics treated under 2400° F. Specially molded plastics, resistant to chemicals, water absorption and heat. Special pump design for ease of operation. Water insecticide, and steam outlets screened to prevent foreign elements entering vital parts. Fully guaranteed by manufacturer. Super heated dry steam does not dilute the insecticide, it is stated, but acts as a vaporizing, activating and driving force only. Any liquid concentrate insecticide or deodorant may be used in the Electro Sprayer.

Specifications of Tigress Vaporizing Insecticide, for especial use in connection with Electro Sprayer, follow: Peet Grady tested 100% fly kill. Laboratory tested cockroach kill of 92 out of 100. Contains a high percentage of pyrethrum. Toxicants are blended in a carrier base of highly refined mineral oil. No kerosene! Leaves no persistent after-odor; no greasy residue, it is stated. 100% active ingredients. No dilution necessary. No waste.

For complete particulars write: ORGANIZED DISTRIBUTORS, INC., Dept. P, 3125 E. Seventh St., Oakland 1, Calif.

IMPROVED PYRIN No. 20

Technical bulletin discusses Improved Pyrin No. 20 vs. Pyrethrum Extract No. 20. Sesamin as a synergist for pyrethrum, principal characteristics, suggested formulae, roach test (USDA method), etc. Sample on request. John Powell & Co., Inc., 1 Park Ave., New York 16, N. Y.

ANTU-BASED RODENTICIDE

Developed during the war and now released for civilian use, ANTU (AlphaNapthylThioUrea) is the toxic agent of Formula 83, a new rat poison offered by O. E. Linck Co., Inc. Sold on a money-back guarantee, Formula 83 contains both eating and drinking baits. Although each 35c package has a potential kill, it is claimed, of more than 1,000 rats, it is harmless to poultry. Attractively packaged for over-the-counter sale. O. R. Linck Co., Inc., Montclair, N. J.

FOR THE FOLLOWING PUBLICATIONS
WRITE WOOD TREATING CHEMICAL CO., 5137 Southwest Ave., St. Louis 10, Mo.

WOOD TREATING CHEMICALS

Leaflet, color-illustrated, describes pentachlorophenol-based wood-treating chemicals available in ready-to-use or concentrated form for wood preservation, termite prevention and dimensional control. Also discussed are such methods of wood impregnation as: vacuum-and-pressure, hot and cold open tank and cold open tank.

Write WOOD TREATING CHEMICALS CO., 5137 Southwest Avenue, St. Louis 10, Mo.

WOOD PRESERVATIVES

Discussed are several products for the control of decay, blue stain, termites, powder post beetles, swelling, warping, checking, shrinking, moisture absorption, grain raising. Illustrated.

HAND-OPERATED HYDRAULIC SPRAYER

A new hand operated all-metal hydraulic sprayer, built to aircraft precision standards, has been developed by the Cornelius Company, Minneapolis, for aerosol-type spraying of chemicals, insecticides, disinfectants, lotions and similar fluids.

An important feature of the new sprayer which measures less than 6" from nozzle to handle, is use of a revolutionary hydraulic principle by which a 300-pound nozzle pressure is built up with a single 2⅛" stroke of the piston.

This pressure, discharged through a special nozzle containing an orifice .006" in diameter, reduces fluids to an aerosol fog, an important advantage particularly in the application of DDT space spray solutions.

Made entirely of brass and stainless steel, the sprayer has neither packing nor gaskets, yet can be operated in any position without danger of leakage, due to specially designed airlock around piston.

The Cornelius sprayer is supplied complete with 8-ounce screw-type glass container (for chemicals, insecticides, etc.). Extra container is included in each package for added convenience when different types of solutions must be kept ready for use.

Details about the hydraulic-aerosol sprayer and its range of applications may be obtained from the Cornelius Company, Dept. P, 1621 E. Hennepin Avenue, Minneapolis, Minn.

Insecticide Formulations for Household Livestock, Farm and Industry use.

Brochure contains new information which has become available during recent months on DDT and Lethane concentrates, etc.

Rohm & Haas Co. Dept P., Washington Square, Philadelphia 5, Pa.

NEW M.S.A. INDUSTRIAL GAS MASKS BULLETIN

A new 4-page bulletin describes and illustrates Mine Safety Appliances Company's Industrial Gas Masks for protection against individual industrial gases or combinations of gases, smokes, vapors, and dusts (with the exception of carbon monoxide and illuminating gas.) For many applications the masks are U. S. Bureau of Mines Approved.

The M.S.A. "All-Vision Facepiece," featured in the new bulletin, it is stated, permits unobstructed vision covering all normal viewing angles. Inbuilt fogproof construction prevents moisture condensation on the large, specially-contoured lenses, which are made of shatterproof glass and are replaceable and interchangeable. A minimum of dead air space cuts down re-breathing of exhaled air. The "All-Vision" Face-piece is made of molded special rubber—comfortable and easy to wear. Providing gas-tight fit on any face without "pressure points," the Facepiece insures worker safety and contributes to efficiency on the job.

The M.S.A. "All-Vision" Facepiece is available equipped with a Speaking Diaphragm which insures perfect communication between men, over the telephone, and through speaking tubes.

The new bulletin includes the broad selection of canisters available for use with M.S.A. Industrial Gas Masks, and a comprehensive list of gases against which protection is afforded.

For safety in low concentrations of poisonous and irritant gases, fumes and dusts, the M.S.A. Canister-Type Half-Mask, described in the new bulletin, may be used. The Half-Mask, like the "All-Vision" Face-piece Mask, does not interfere with goggles or headgear, it is stated.

M.S.A. Industrial Gas Masks are furnished —complete with harness, canister, facepiece and connecting tube—in strong carrying cases of hard vulcanized fibre.

For a copy of the new bulletin on M.S.A. Industrial Gas Masks, address this publication or direct to Mine Safety Appliances Company, Dept P, Braddock, Thomas and Meade Street, Pittsburgh, Pennsylvania.

DDT BOOKLET

A new eight-page color booklet has been prepared by the Pennsylvania Salt Manufacturing Company to describe its five Penco DDT products for the agricultural and insecticide industries and give some basic facts about DDT itself.

The booklet explains exactly what DDT is, how it can best be used, what limitations it has and where it excels in insect control.

The booklet contains full instructions for preparing various dilutions of the five products as well as complete instructions for their use, and what insects they control.

WRITE PENNSYLVANIA SALT MANUFACTURING COMPANY, Dept. P., 1000 Widener Building, Philadelphia 7, Pa.

MSA DEMAND-TYPE OXYGEN MASK*

Mine Safety Appliances Co., Braddock, Thomas and Meade Sts, Pittsburgh 8, Pa., announces a demand-type oxygen mask for respiratory protection in unbreathable atmospheres. It is always ready for use and requires no special training or practice for operation: the wearer needs only to put on the mask, open a valve and breathe. One of the two types has an oxygen cylinder on the wearer's back supported by an adjustable harness, with oxygen supplied for an hour of normal breathing. The front sling type has a smaller cylinder for shorter periods. Both provide oxygen exactly as needed by the individual wearer by means of the demand regulator. The mask is equipped with a pressure gage which indicates the amount of oxygen in the cylinder at all times. The breathing tube is quickly disconnectable for conservation of oxygen during stand-by periods. Fogging of the mask's all-vision facepiece is prevented by a flow of cool oxygen over the lenses.

MINE SAFETY APPLIANCES CO., Braddock, Thomas and Meade Streets, Pittsburgh 8, Pa.

The NPCA Fumigation Committee is not ready to recommend the use of oxygen type of equipment on commercial fumigation work. It very definitely has a place in rescue or emergency work. The Committee continues to recommend the use of the canister type mask—Ed.

FOR THE FOLLOWING PUBLICATIONS
WRITE AMERICAN CYNAMID & CHEMICAL CO., 30 Rockefeller Plaza, N. Y. 20, N. Y.

FUMIGATION SAFETY RULE

Discussed in this fumigation service letter are helpful instructions in connection with the locking of all doors and accessible windows, placing of warning signs thereon and the guarding of premises during fumigation.

GAS MASKS

Some constructive suggestions on the care and maintenance of gas masks are contained in this News Bulletin.

NEW SPOT FUMIGANT

Leaflet describes Acrylon, a new spot or local fumigant. Very effective, it is stated, for use in treating the machinery in flour mills, bakeries and many other places, particularly for the control of Mediterranean flour moth, confused flour beetle, flat grain beetle, cadelle, and similar insects. Not a contact spray, Acrylan, it is further stated, has no deleterious effect on baking qualities of flour and leaves no residual odor.

FIRE IN A BUILDING UNDER FUMIGATION—PROCEDURE

Is the title of an informative bulletin on the subject. Also included are answers to some fumigation questions of interest to every PCO.

FUMIGATION SAFETY RULE

BULLETIN 80.

EFFECT OF HYDROCYANIC ACID ON FOODSTUFFS

REMOVAL OF PHOTOGRAPHIC FILMS AND PAPERS BEFORE FUMIGATION

BULLETIN 88.

EDUCATE THE DOCTOR IN FUMIGATION FIRST AID PROCEDURE

ELECTRIC FANS HAVE SEVERAL USEFUL FUNCTIONS IN FUMIGATION WORK

BULLETIN 84.

DDT FORMULATIONS BULLETIN DISCUSSES

BULLETIN 94.

FUMIGATOR'S FIRST AID KIT

BULLETIN 93.

DEVELOPMENT OF HCN FUMIGATION

BULLETIN 96.

METHYL ORANGE TEST PAPERS

BULLETIN 95.

MECHANICAL MEANS FOR QUICK VENTILATION OF FUMIGATED SPACES

BULLETIN 97.

ANT BAIT

Circular describes a jelly ant bait with Thallium Sulphate as its toxic ingredient. Sample tube on request.

WRITE LETHELIN PRODUCTS CO., Mount Vernon, N. Y.

FUMIGATION MANUAL

76-page manual describes safe handling and working with "Cyanegg" and on fumigation procedure and insect control. Illustrated.

WRITE E. I. DU PONT & CO., Wilmington 98, Delaware.

METHYL BROMIDE

What it is; what it does; how to use it. Described are dosage schedule for various type pests, methods of application and preliminary precautionary measures.

WRITE WESTVACO CHEMICAL CO., Chrysler Bldg., N. Y. C.

--BOOKS--

Broaden Your Knowledge—Increase Your Proficiency—Help You in Your Business

Unbidden House Guests

By DR. HUGO HARTNACK

The volume discusses about 2,000 house guests. It consists of 4 parts:

I. General Part: What are housepests today? Borderlines of Housepest field. Climate of the House. Housepests worldwide. Influence of the house on the housepest. Spoorology (Diagnostic) of Housepests. Damage by housepests (54 pages of pictures). Pests and Wastes. Fighting housepests outdoors. Exterminating methods. Formulae. Pages: 238.

II. Plants as Housepests. Bacteria. Molds which live in the house. Timber rot, fungus. What plants do to housepests and what housepests do to plants and plant products. Pages: 62.

III. Lower Animals. Protozoa, worms, snails, millepedes, spiders, mites, many others, as far as they are housepests. Pages: 112.

V. Backboned Animals. Chordata, coldblooded and warmblooded. Rodents, rats and mice take 56 pages. Formulae, Index. Pages: 148.

Price $12.00, plus 25c postage

The New 1945

Chemical Formulary—Vol. VII

By EDITOR-IN-CHIEF, H. BENNETT

Price $6.00 plus 15c postage

Volume VII of "The Chemical Formulary" includes thousands of the best and most practical formulae, compiled by authorities and experts in each field of industry. Each formula is new, and different from those in previous volumes.

Formulas for pest controls are extensive, and are the results of the most recent research. They include general and agricultural insecticides, parasiticides, larvicides, vermin exterminators, cattle grub control, Ant poison, mothproofing emulsions, fly control spray, Japanese beetle larvae control, lawn grub control, roach powder, silver fish poison, hide and skin beetle control, insect repellents, horticultural sprays, and Rotenone-Derris substitutes.

This valuable book describes and explains the latest commercial methods and processes. It will bring you valuable data and ideas that would otherwise be accessible only after consulting dozens of other books.

Emulsion Technology

A SYMPOSIUM

Price $5.00 plus 15c postage

A timely and practical book which discusses the new developments in emulsions and the outstanding role they are playing in industry. Much valuable data, concerning the equipment and techniques used in the manufacture of emulsions, are included.

CONTENTS: Mechanism of Emulsification; Fundamental Principles of Practical Emulsion Manufacture; Use of Highly Dispersed Emulsions in the Treatment of Toxaemic Conditions; Emulsions in the Patent Literature; Industrial Emulsion Formulation; Design of Emulsifying Machines; Effect of the Mode of Preparation on the Dispersion of Soap-Stabilized Emulsions; Problems Connected with the Preparation and Application of Emulsions Used in Agricultural Spraying; Observations on a Typical Food Emulsion; Emulsions and Emulsification in the Wool Textile Industry; Stability of Emulsions in Thin Films; Emulsion Paints; Emulsions in the Leather Industry; Rubber Latex; Physical Properties of Dispersions of Asphaltic Bitumen; Index.

Substitutes

By H. BENNETT

Price $4.00 plus 15c postage

A handbook of substitutes and alternatives for chemicals, fibres, metals and other commercial products including a plan for choosing proper substitutes. This book is the result of the author's wide knowledge of substitutes and alternatives for numerous products in diverse industrial fields.

CONTENTS: Substitute Requirements; Formulation; Proportions; Methods of Manufacture; Costs; Use of the Finished Product; Testing; List of Substitutes and Alternatives.

"How to Know the Insects"

A very valuable book for every pest control operator. This book, with its 140 pages and more than 250 careful drawings, is an excellent reference book for P.C.O.'s as well as for experienced entomologists.

Price for spiral binding.....$1.50 plus 15c postage
Price for cloth binding..... 2.50 plus 15c postage

Spray Chemicals and Application Equipment

The new book "Spray Chemicals and Application Equipment" is the result of six years research and collection of data by Wayne B. Fisher, B.S.A., Purdue University, chemical sales representative, and commercial horticulturist, cooperating with Dr. J. A. McClintock, Professor of Horticulture, Purdue University (co-author).

The book "Spray Chemicals and Application Equipment" is divided into two parts. Part one gives the interesting historical background of many chemicals and detailed discussions and photographs showing now they are manufactured. In addition, much discussion is devoted to methods of using spray chemicals, to insects and diseases controlled by the specific chemicals, and to methods of improving present day pest control practices.

Part two is a complete discussion describing almost every type of sprayer and duster available to the public for use in applying spray chemicals. About 300 illustrations are included in this section, and all types of equipment is shown ranging from the simplest atomizer sprayer to the largest commercial sprayers and airplane dusting equipment.

Price $4.00 plus 15c postage
Foreign $5.00 plus 35c postage

Practical Emulsions

By H. BENNETT

Price $5.00 plus 15c postage

An authoritative handbook which concentrates upon the more practical side of manufacturing, using and evaluating emulsions for industrial use and commercial distribution.

CONTENTS: Emulsifying Agents; Types of Emulsions and Foams; Methods; Formulation, Equipment; Stability; General Technical Emulsions; Dispersing Agents and Wetting Agents; List of Emulsions; List of Demulsifying and Defoaming Agents; Agricultural Spray Emulsions; Cutting Oils, Soluble Oils, Miscible Oils; Emulsifying Agents; Bituminous Emulsions; Cleaners and Soaps; Cosmetic and Drug Emulsions; Defoaming Agents; Food Emulsions; Gasoline Emulsions; Lacquer Emulsions; Leather Treatment Emulsions; Lubricant Emulsions; Medicinal Emulsions; Paint Emulsions; Paper Processing Emulsions; Polish Emulsions; Resin and Rubber Emulsions; Textile Emulsions; Miscellaneous; Dispersions.

Practical Tree Surgery

By MILLARD F. BLAIR

An authoritative manual indispensable for Spray Operators and Tree Surgeons. It gives valuable information pertaining to the association between trees, fungi, and insects; and discusses the means employable in obviating some of the most serious injuries to them. Contains 89 excellent illustrations and line drawings.

Cloth binding .....$4.00 plus 15c postage
Special binding ..... 5.00 plus 15c postage

Insect Enemies of Shade Trees

By GLENN W. HERRICK

This book discusses primarily the problem of preservation of shade trees from insect pests also describing accepted methods of fertilizing shade trees. It is intended for pest control operators engaged in the business of treating and caring for shade trees, and for all others interested in preserving shade trees. The book discusses in detail all the important insect enemies of shade trees east of the Rocky Mountains, and most of those on the Pacific coast. The book is illustrated with 350 photographs and drawings. Contains 417 pages. **Price, $5.00 plus 15c postage.**

202 Common Household Pests of North America

BY DR. HUGO HARTNACK

A 320 page book dealing with 202 common household pests of North America and showing about 400 illustrations.

The book contains valuable information. It not only deals with all common and less common household pests, but also with rodents, pigeons, sparrows, spiders, centipedes and mites. All are arranged in a distinct systematic order which makes it easier for one to know the relationship of each pest.

A book that should be in every PCO library.

Price $5.00 plus 15c postage

The Chemistry of Synthetic Substances

By EMIL DREHER

"A brilliant summation of the latest research in the chemistry of synthetic substances. We recommend this book highly for its completeness. It will satisfy those who have waited for a thoroughly competent dissertation in the field."

Price $3.00 plus 15c postage.

The World of Insects

By CARL D. DUNCAN
Professor of Entomology and Botany
and GAYLE PICKWELL
Professor of Zoology
SAN JOSE STATE COLLEGE

In this new book the authors give a general view of a vast and fascinating world.

Comparatively brief and nontechnical, the book reviews the many fields upon which the insect impinges, discussing such topics as insect structures, how insects grow up, insect food and feeding habits, insect food-getting devices, how insects reproduce themselves, how insects get air, how insects move, how insects are protected, insect voices, insect fitness, insect orders, social life among the insects, the value of insects, injurious insects and their control, where to look for insects, rearing insects, and how to collect and preserve insects.

One of the outstanding features of the book is the collection of 194 unusual illustrations, including many striking photographs original with the authors.

393 Pages, 6x9, Illustrated.....$4.00 plus 15c postage

Applied Entomology

By H. T. FERNALD and HAROLD H. SHEPARD

Fourth edition. 400 pages. 6x9. 383 illustrations. Quickly gives the main facts you want about: Silverfish, firebrat, termites, roaches, grasshoppers, earwigs, booklice, onion thrips, flower thrips, squash bugs, cotton strainer, bedbugs, 17-year locusts, leafhoppers, whiteflies, scale insects, mealybugs, borers, June bugs, Japanese beetles, potato beetles, asparagus beetles, weevils, clothes moths, fruit moths, cotton leaf worm, army worms, cutworms, tomato worms, mosquitoes, midges, horseflies, maggots, house flies, fleas, wasps, ants, gall insects.

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Virus Diseases in Man, Animal and Plant

A survey and reports covering the major research work done the last decade.

The book gives a survey of the monetary status of virus investigation with special consideration of the most recent literature, especially foreign. One of the most important books of its kind offered.

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The Knack of Selling Yourself

The "Knack of Selling Yourself" is just off the press. It is a good book for every P.C.O. to have in his library, for it deals with ideas and methods of selling oneself to the public. Every P.C.O. has this problem and on the successful solution of this problem depends the success of his business. This book definitely aids in the solving of this difficulty, contains 234 pages and is full of new ideas. Order from PESTS.

The cost is $3.00 plus 15c postage

Insect Pests

By WM. CLUNIE HARVEY and HARRY HILL

Price $4.25 plus 15c postage

The extermination of vermin is a skilled proceeding requiring the employment of scientific methods and of persons possessing technical knowledge. This authoritative book will prove of definite and practical value for all who are interested in the control of insect pests and in the prevention of disease.

CONTENTS: General Outlines of Insect Control; The Bed-Bug; The Flea; The Louse; Other Insect Pests; Building Construction and Infestation; Gaseous Fumigants; Other Specifics; The Technique of Fumigation; Insect Control and Educational Measures; Legislative Control; Human Toxicology; Disinfestation of Foodstuffs; Disinfestation of Ships; Forms and Records; Index.

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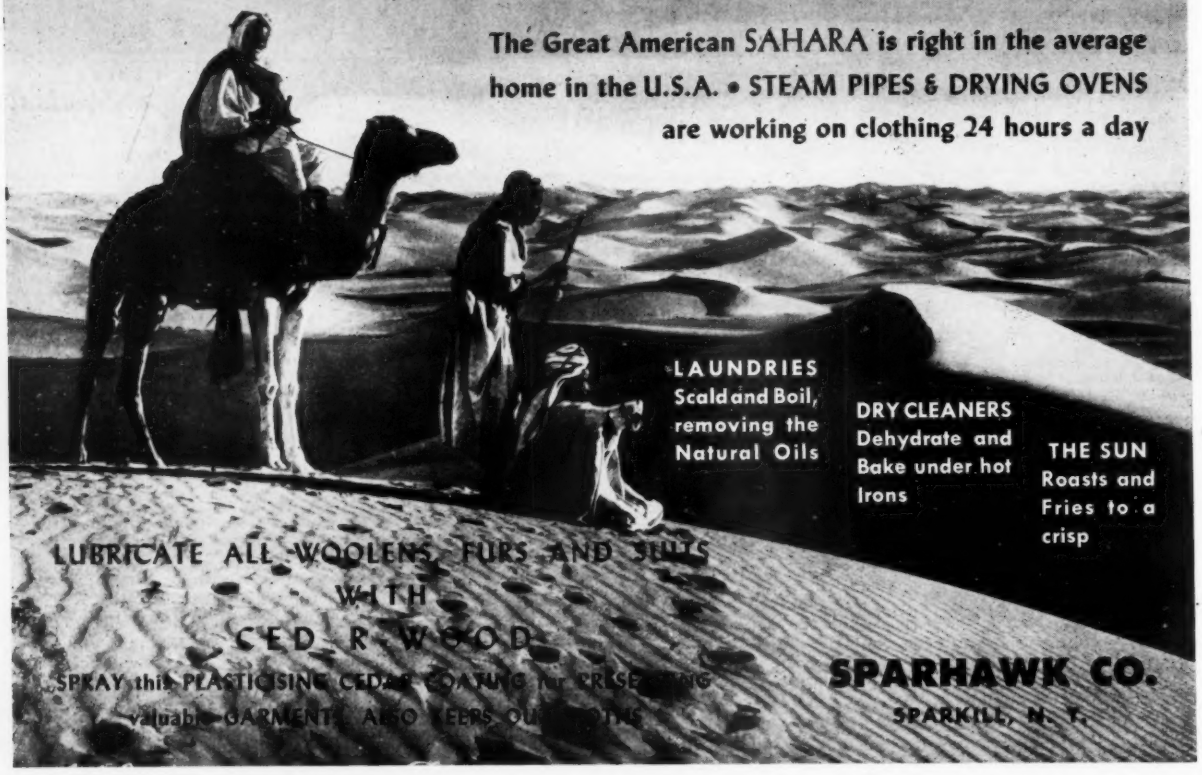
Have you a DESERT in your Closet?

The Great American SAHARA is right in the average home in the U.S.A. • STEAM PIPES & DRYING OVENS are working on clothing 24 hours a day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valuable GARMENTS. ALSO KEEPS OUT MOTHS
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TERRA TOX

TOUGH on TERMITES . . . . . but EASY FOR YOU!

YOUR TERMITE CONTROL JOB IS NO BETTER THAN THE SOLUTION YOU USE

The success or failure of your termite control job depends on the solution you use.
For full effectiveness in treating wood infested with termites, use TERRATOX. TERRATOX is a highly concentrated chemical that will insure the success of your termite control job. Diluted according to directions, TERRATOX (No. 225, 235, and 245) contains the required 5% (by weight) pentachlorophenol, to meet the standard recommended by the U.S. Department of Agriculture.

TERRATOX is an economical and highly effective solution that is certain to improve your termite control jobs. You don't pay for water or thinner, you simply add it to TERRATOX. The highly concentrated form in which TERRATOX comes to you, saves shipping costs and makes it easier to handle. TERRATOX is available in 1 and 5 gallon cans and 30 and 55 gallon drums.

Write for informative TERRATOX bulletin.

Oil soluble TERRATOX (No. 225, 235, and 245) are especially formulated for treating wood in buildings already attacked by termites, and is also recommended in soil treatment. Water soluble TERRATOX (No. 215) is effectively used for treatment of soil around buildings for control of termites and contains sodium salt of pentachlorophenate, with high saturation power.

TERRATOX comes in both oil soluble and water soluble forms so that you can select the form best suited for your particular needs, and which will give you the most efficient result for your termite control jobs.

WOOD TREATING Chemicals Co.
5137 Southwest Ave.
St. Louis 10, Mo.

MORE PROFITABLE PEST CONTROL

PACK A PUNCH in your industrial and home fumigation program. Use the fumigant that penetrates because it's powerful, the fumigant that's profitable to employ in your fight against pests.

Moth control ceases to be a problem to the P.C.O who uses Larvacide. It penetrates dense materials, blankets, upholstery, sacked material, etc. Egglife and larvae are included in the sweeping kill of this chlorpicrin (tear gas) fumigant.

Commercial fumigants become more profitable with Larvacide's surer kill and penetration. It catches not only all types of moth life but also flow and granary insects, tobacco beetle, drug store beetle, and other warehouse insects which might elude gases less potent.

Profit by the experience of P.C.O.'s over a period of more than 20 years. They know of these advantages:

- ***Warning that cuts accident risk.***
- ***Extra penetration and killing power.***
- ***Ease of application—there's no heavy apparatus to lug around.***

Larvacide

• comes in cylinders of 25, 50, 100, and 180 lbs., and in handy 1-lb. Dispenser Bottles, each in sealed can, 12 to case.

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HOUCHIN'S INSECT POWDER DUSTERS

Capacity 4-Oz. Screened Cover

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A Handy Way To Use Red Squill!

Goes a long ways and does an excellent job.

Spread a thin coating of

LENZ RED SQUILL RAT PASTE

over full slices of bread

then cut each slice into 20 to 25 pieces and you have a bait rats will take regardless of the food they have access to—we all know the value of bread as a bait for rats—sticks tight to any kind of bait—will never harden—spreads like soft butter in any kind of weather—hot—cold—or humid and has a good "come on" odor.

Each pound makes about 400 baits

Cost per bait is low and baits are so handy and effective that any inexperienced employee can do an expert job.
Make the baits right on the job.

Send for the HANDY KIT SIZE and use it on your next job. One Trial Convinces!

Handy Kit Size	RESALE SIZES	
24 oz. can $2.17 *Good for 600 baits.*	6-⅛th oz. can $1	3 oz. jar 50c
In BULK for large users and repackers	1 Dozen ....$ 7.00	1 Dozen $4.00
65 lb. drum 79½c lb.	4 Dozen 26.00	2 Dozen 7.20
6 or more drums 75c lb.		4 Dozen 13.40

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Prepaid if cash accompanies the order.

Lenz Laboratory
Sycamore, Illinois

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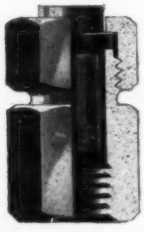

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- **Spray nozzles ¼T-8001, ¼T-8002, ¼T-5001 5 and many other sizes available.**

SPRAY NOZZLES for residual spraying

D. D. T.

DDT is effective in proportion to the thoroughness in which it is sprayed. Spraying Systems Flat Spray Nozzles provide perfect distribution. Already proved by use throughout the U.S.A. and world-wide war zones. Write for complete information.

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SPECIALISTS IN SPRAY NOZZLE DESIGN AND MANUFACTURE

WHAT'S NEW IN PEST CONTROL-PERSONALS

Billy Buettner, Jr., son of NPCA's secretary, in case you'd like to know, has been promoted to sergeant after only a year in the army. He is stationed at Frankfort, Germany. Certainly looks like the Buettner family is going places. More power to them.

MISS DOROTHY HOGG REJOINS KILLER-DILLER

Miss Dorothy L. Hogg, formerly sales and advertising manager, has rejoined the firm and will again direct all sales and merchandising activities of Killer-Diller rat and mouse poison.

The Killer-Diller Corporation, 741 N. Milwaukee Street, Milwaukee, has taken over manufacture and distribution of Killer-Diller Rat and Mouse Poison, a product formerly made and distributed by N. H. Stark & Company, Grafton, Wisconsin.

Effective at once, all Killer-Diller orders and correspondence should be addressed to the Killer-Diller Corporation at the address shown above.

COL. C. L. SPEIDEN PASSES—Colonel Clement L. Speiden, former vice-president of Innis, Speiden & Co., chemicals manufacturer, New York, died in Charlottesville, Va., June 1. He was fifty-two years old. A veteran of both World Wars, Col. Speiden entered the company after the first war, working in the firm's foreign department, and later became secretary and then vice-president. He retired nine years ago from active participation in the company but retained a directorship.

Buettner Pest Control Co., Brooklyn, N. Y., has purchased the interests of the Continental Exterminating Corp., N. Y., and will merge the business with the Buettner Pest Control Co. Congratulations, and best of wishes for your continued growth.

A PCO writes in to ask if red ants are supposed to be the busiest creatures on earth, where do they find so much time to go to all the picnics? I don't think I'd like to be an ant myself. I'd hate to have to live off sandwiches all the time.

The Smitter's Fumigating Service has moved to their new and larger office at 1650 Division Ave. S., Grand Rapids, Mich.

The Michigan Industrial Fumigant Co., operated and owned by the Smitter's Fumigating Service will also occupy the same building.

The Atlantic Exterminator of Waylyn Navy Yard, S. C., has moved into their new location, 19 Houston St.

GEORGE B. LAY JOINS WALTHAM CHEMICAL CO.

Mr. Lay obtained his Master's Degree in entomology and botany at North Carolina State College, Raleigh, N. C., in June 1932; and then worked one year towards a Doctor's Degree in entomology. Prior to this training, he obtained his AB degree in June 1918, in absentia (as he was in the Army in the field artillery) from the University of North Carolina, Chapel Hill, N. C., specializing in Geology and English.

After getting out of the Army in World War I he taught school, was a newspaper reporter and owner of several papers.

Just prior to going with the Biological Survey as a rodent control technician, in charge of the Southern States, he was with the N. C. State Forest Service and helped run a CCC camp. He was first located at Raleigh, N. C., when he went with the Biological Survey, as District Agent, but in July 1938, he was moved to Boston and put in charge of the expanding work of the Survey in the 14 northeastern states. A native of Concord, New Hampshire, where he graduated from St. Paul's School, in 1914, he was able to build up an effective program in the northeast, and when he resigned on April 19, to go with the Waltham Chemical Co., of Waltham, Mass., he had many times enlarged the work, personnel and effectiveness of the program.

Early in his career as a rodent technician, he became acquainted with the work of the National Pest Control Association. His cooperation with the Association extended over a period of years, the result being that George was made an Honorary Member. He has since continued in many ways to help build a more effective organization and still is on the Association's Rodent Control Committee.

Although Mr. Lay has written considerably, he has seldom taken credit by name for such articles. The men who worked "with" him and whom he called "his boys" got the credit for articles, leaflets, etc., as he "figured" that the "boss" would get plenty of credit if he had a "bunch of boys" who "got the credit."

Mr. Lay had much to do with making the Amherst conferences successful and was present when the plans were made for the first such conference.

When he resigned, it was from the Division of Predator and Rodent Control, Fish and Wildlife Service (as the old Biological Survey had gone out of existence) after 11 years of work as a rodent specialist. During that period, his interest in entomology did not disappear and his knowledge of conservation as a whole increased.

Mr. Lay is married and lives at 18 Pleasant St. Hopkinton, Mass., where he has over an acre of land, operates a garden and enjoys country life. He is a commander of the Hopkinton Legion Post and junior warden of St. Paul's Episcopal Church.—B.E.

CHEMISTS ELECT OFFICERS

SKYTOP, PA.—The Manufacturing Chemists Association of the United States elected officers and 15 executive committee members at its annual meeting here on June 6.

Charles S. Munson, chairman of the executive committee, U. S. Industrial Chemicals, Inc., was elected president to succeed H. L. Derby, president of the American Cyanamide and Chemical Corp.

Leonard T. Beale, president of the Pennsylvania Salt Manufacturing Company, Philadelphia, and H. O. C. Ingraham, vice-president of the General Chemical Company, were elected vice-presidents.

J. W. McLaughlin, Carbide and Carbon Chemicals Corp., was named treasurer, and Warren N. Watson, Washington, D. C., was re-elected secretary of the Association, which maintains its headquarters in Washington.

The Association, an organization of some 80 chemical corporations, elected the following executive committee:

George W. Merck, president of Merck and Company, chairman; Lammot du Pont, chairman of E. I. du Pont de Nemours, vice-chairman; Mr. Derby; C. S. Hosford, Jr., president ofthe Victor Chemical Works; John L. Smith, president of Charles Pfizer and Company, Inc.; Clyde D. Marlatt, vice-president of the Martin Dennis Company.

W. S. Landes, vice-president of the Celanese Corporation of America; P. T. Sharples, president of Sharples Chemicals, Inc.; H. I. Young, president of American Zinc, Lead and Smelting Company; and William M. Rand, president of Monsanto Chemical Company.

CITY RESIDENTS WIN PRAISE ON RAT CONTROL

Dayton residents are giving "excellent co-operation" in observance of the rat control law which went into effect May 10, E. V. Stoecklein, welfare director, reported today.

The law permits the city health to inspect business buildings and residences and requires structural changes to make them rat proof.

Stoecklein said a city health inspector in charge of rat control work is devoting full-time to a block-by-block inspection of buildings throughout the city, followed by necessary orders to owners for changes.

Slogan of the city's rat control campaign, he said, is to "build them out and starve them out."

Besides the changes in buildings to make them rat proof, the law regulates disposal of garbage and storage of food so that rats will be unable to survive.

LT. H. P. WILSON

One of the AAF's youngest and most brilliant navigators, long reported missing, was killed, his parents recently were informed.

He was 2nd Lt. Howard P. Wilson, son of R. W. Wilson, owner of the Wilkil Company, Los Angeles, California.

Howard, an honor graduate from Los Angeles High School and a chemistry student at the Los Angeles campus of the University of California when he enlisted, was commissioned as a navigator from the University of Miami in December, 1943. He was 19 and top man in his class.

After logging 594 flight hours with the Pathfinders of the 8th Air Force during which he was lead navigator for a flight of C-47's and had had a crash landing in Reims, been through the Normandy and Holland "drops," he was reported missing on Feb. 5, 1945, on a little flight from Naples to Rome.

Some Thoughts on Termites—Bergen Evans, professor of English at Northwestern University, states in his book, "The Natural History of Nonsense," to be published soon:

"Termites alone would furnish matter for a score of editorials. Their workers are nearly blind, and hence can't strike (score one for capital); but the warriors can't feed themselves, and hence are wholly at the mercy of the workers (score one for labor); and the queen is reduced—or, rather, enlarged—to a vast reproductive organ (behind which cowers the timorous king), squeezing out sixty eggs a minute, year on end, and devoured by her subjects the moment she falls behind schedule (score one for management.)"

Do you know what the bumble bee said to the flea? "Watch out, that's DDT."

Rotenone Extracted by New British Process—A new process for the extraction of rotenone from derris root is described in a recent British patent. According to the claims made, both the resins and the rotenone are first extracted with acetone. The

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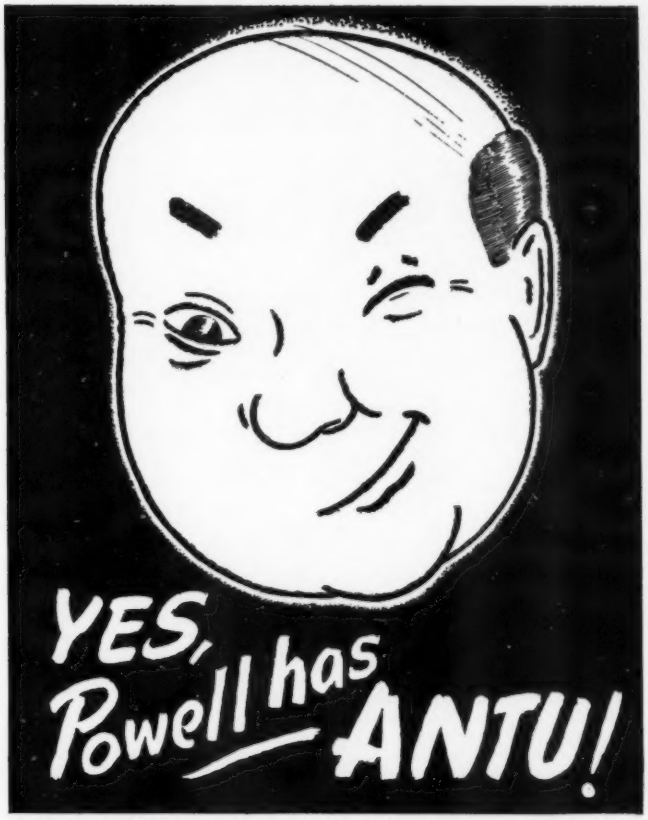

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ANT TRAPS, 1, 3 & 7½ oz. Tubes 10 Lb. Jars

Used professionally it assures customer satisfaction.

Preferred by discriminating PCO's.

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MOUNT VERNON — NEW YORK

EXTERMINATORS CHEMICALS

RUMETAN (Zinc Phosphide)

FOR RAT CONTROL

(The ideal poison for
Rats, Mice and Mole Crickets
Effective and Economical)

Sodium Fluoride, White and Tinted
Sodium Silico Fluoride
Pyrethrum Powder
Sodium Arsenate, etc.

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EMPIRE STATE BUILDING, NEW YORK

bulk of the acetone is then removed, and the rotenone and resinous constituents in the residue are separated by dissolving the residue in alcohol., The rotenone is selectively precipitated from the alcohol on standing.—(U.S.I.C.N.)

TEXAN BEDBUG—Of Texas jokes there is no end, and most of them have to do with the state's monstrous size. There is, for instance the story told by John Gunther in June Harper's, of the New Englander who, visiting Texas, found a lobster in his bed. Tactfully, and fully aware of Texan propensities to the grandiose, he said to his host, "Look at this Texan bedbug." Whereupon the host shook his head doubtfully and answered, "Must be a young one."

INSECTICIDES competing for public favor now include such phonetically similar names as Airosol, Aer-A-Sol and Aerosol, and it's a cinch they won't be considered suitable candidates for radio advertising.

MICE SABOTAGE U. N.—Mice sabotaged the United Nations' Security Council meeting yesterday at Hunter College, Bronx Center, N. Y. The public-address system alternately gave voice to a booming static, or simply went dead. The victims were Dr. Herbert V. Evatt of Australia, and Dr. Oscar Lange of Poland, both speaking on the Spanish case. So far as U. N. technicians could figure out, the mice found rubber cable insulation more appetizing than cheese in traps. The disturbance lasted fifteen minutes before technicians restored the sound system.

Gets the Gallinipper—An ingenious and simple poisoning device that works automatically against certain types of vexatious mosquitoes does so by withholding a deadly dose of DDT until it is needed and then delivers it at the time it will be most effective against newly hatched wigglers. Research efforts have been rushed for protection of the armed forces against insect pests and insect-carried diseases.

The device takes advantage of the fact, established by scientific studies of the life habits of the insects, that mosquitoes of the Psorophora group have the habit of laying their eggs in grassy areas that are likely later to be flooded by heavy rains or rising streams and ponds. The eggs mature, and as soon as the land is covered by water, they are ready to hatch almost instantly and soon develop into biting adults. One species is known as the shaggy legged gallinipper; another is the Florida glade mosquito.

Hatching in enormous numbers, these biters may be a terrible pest to troops, farmers, and others working outdoors. Entomologists can inspect an area, locate the egg-infested soil, and predict that trouble will follow. But treating broad areas in the short time between flooding and the biting period has been difficult. The new development permits making preparations in advance of hatching. The new device is a bottle containing a small quantity of DDT in oil. The bottle is partly buried in the soil in an area where hatching is likely. The bottle has an opening just above ground level. As soon as flood water rises to this opening the oil floats out and spreads a thin, deadly film to kill new hatched wigglers when they come to the surface.

DDT, however, is toxic to fish and other forms of aquatic life. The conditions under which the new device may be used still remain to be worked out. Tests are expected to be made on the device in salt marshes and areas subject to flooding against other species of mosquitoes having egg-laying habits similar to those of the Psorophora group.—(Inside News)

Aerosol Insecticide Bombs Retail Price Set—A retail ceiling price of $2.65 has been established for new one-pound insecticide liquid aerosol bombs declared surplus by the government and now available to civilians, the Office of Price Administration has announced today. Packed 24 to a case, the bombs contain pyrethrum, DDT, cyclohexanone and lubricating oil. On all sales to wholesalers, the ceiling price is $1.15 each, and on sales to retailers the ceiling is $1.70 each. The ceiling price must be plainly marked on each bomb for sale at retail.

—Oil, Paint & Drug Reported

Testing DDT with Infrared Technique—Through use of invisible light beyond the red end of the rainbow, a quick method for analyzing DDT has been developed which makes possible a better control of the quality of DDT insecticides, according to du Pont chemists.

Infrared light is made to pass through a DDT solution, and the intensity of the various wave lengths of light that emerge is automatically plotted. The arrangement of the atoms in the molecules of the DDT sample is thus indicated in graphic patterns, as distinctive for each of the chemical compounds present as the finger-prints of a human hand.

By the spectrographic method it is possible to detect the presence of certain isomers and other materials not readily identified by analytical methods now in use. In addition, it is possible to analyze a sample of DDT by the infrared technique in about 30 minutes, an operation that would require days by conventional chemical procedures. Moreover, the spectrographic method is described as being so sensitive that even the minute amount of DDT washed off a wall with a few strokes may be detected.

—Chem. & Eng. News

It is with the sincerest regret that we report the death of the mother of Father O. Fournier, our instructor so greatly admired by all who have attended the Annual Conferences at the University of Montreal. The sympathies of the Association were expressed by a floral arrangement.

Bill Bomby has been up in the air again, having flown to Scotland, no doubt to improve his Scottish broque in order that he can compete more successfully with Prof. "Bob" Thompson of the Guelph Agricultural College, Guelph, Ontario.

Waltham Chemical Co., of Waltham, Mass., has moved into their new home, 817 Moody St. Their expanded facilities will give them ample room for the continuance of the manufacture and sale of Martin's insecticides and Pest Control service.

Employees and management alike will be able to operate more efficiently in their quarters.

"Bart" Eldredge is owner of the Waltham Chemical Co. We wish you more success "Bart."

Wm. Halperin of Pestroy Company of Ottawa, we understand, has returned home after a short time in the hospital. Best wishes.

RAT POPULATION RISE REPORTED

The State Department of Health informed Governor Warren today that the increase in the California rat population, especially in heavily populated centers, "is a distinct menace," and urged all communities to carry on a general rodent control program.

Typhus Fever, the Department reported, has increased among rodents and humans.

The rat increase was attributed to a shortage of men to conduct control programs, inadequate garbage collecting and the increase of chicken and rabbit feeding in suburban areas.

New methods of control have been developed and state crews are giving instructions to local groups, the report stated.

Far Eastern Rotenone Plantings Neglected—Department of Commerce reports that the Japanese neglected 2,500 acres of estates in British Malaya, pre-war source of rotenone, so that "the roots of the derris plants in Malaya will deteriorate within the next six months if not given proper care, according to AIF News.

"Plantings of derris in Malaya run up to 4,200 acres. Stocks of derris in the country, estimated at 175 tons, will shortly be moved to London for the account of the Ministry of Supply.

"The derris industry in Malaya is hampered by labor trouble and the high cost of collecting the roots. Although the United States could consume every pound of derris produced in Malaya for some time to come, reports indicate that trade with that British possession must wait upon re-establishment of civil administration in that area."

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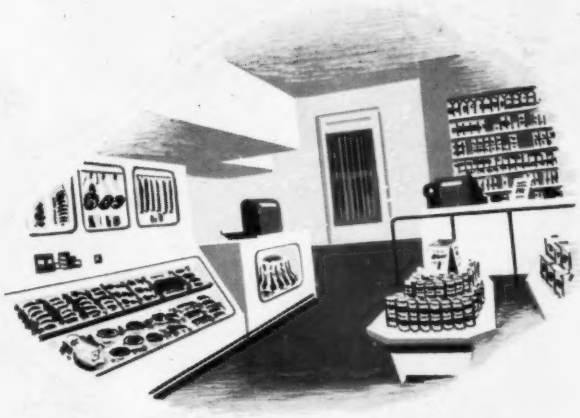
RETAIL GROCERY AND MEAT MARKET FUMIGATION

Dow Methyl Bromide Conquers Cockroaches



*Actual record is on file at The Dow Chemical Company

A midwest operator was faced with the job of exterminating cockroaches from a retail grocery and meat market. Familiar with the difficulty of fumigating perishable foods, he wisely relied on Dow Methyl Bromide. Factual evidence that this penetrating fumigant is completely effective yet harmless to food products when properly applied is presented by his experience:

Building: Two stories, 50,000 cubic feet. Frame with stone basement. Concrete floor. Living quarters above store, food storage in basement.

Preparation: Building sealed with asbestos calcium chloride water mix, masking tape, and oiled kraft paper. Living quarters, adjoining store and apartment above it vacated and guards posted.

Materials Removed: Iodized salt. (Fresh produce closed out for week-end.)

Dosage and Exposure Period: One pound Methyl Bromide per 1,000 cubic feet for 24 hours during week-end period when store was closed.

Method of Application: Methyl Bromide released from cylinders and circulated by fans for sufficient time to prevent stratification.

Aeration Period: Two hours with fans operating.

Results: No signs of life revealed by careful examination. No damage to either groceries or meats.

Why not find out how Methyl Bromide can help *you* handle problems too tough for ordinary fumigants?

The penetrating fumigant

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Mort-O-Mist contains the Standard Insecticide:—

Pyrethrum, D. D. T, and Freon with the necessary Solvents.

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